KONICA MINOLTA

SERVICE MANUAL

THEORY OF OPERATION

bizhub 200 / 250 / 350

The bizhub 200 is available only for North America.

2005.08
KONICA MINOLTA BUSINESS TECHNOLOGIES, INC. Ver. 1.0

THEORY OF OPERATION TOTAL CONTENTS

SAFETY AND IMPORTANT WARNING ITEMS S-1
IMPORTANT NOTICE S-1
DESCRIPTION ITEMS FOR DANGER, WARNING AND CAUTION S-1
SAFETY WARNINGS S-2
WARNING INDICATIONS ON THE MACHINE S-17
MEASURES TO TAKE IN CASE OF AN ACCIDENT S-20
Composition of the service manual C-1
Notation of the service manual C-2

bizhub 200/250/350 Main Unit
Outline 1
Composition/Operation 9

FK-503
Outline 1
Composition/Operation 5

Duplex Unit / Switchback Unit
Outline 1
Composition/Operation 3

DF-605
Outline 1
Composition/Operation 5

PC-102/PC-202
Outline 1
Composition/Operation 3

PC-402
Outline 1
Composition/Operation 3

JS-502
Outline 1
Composition/Operation 3

FS-508/PU-501/OT-601

Outline 1
Composition/Operation 7

MT-501

Outline 1
Composition/Operation 3

SD-502

Outline 1
Composition/Operation 3

SAFETY AND IMPORTANT WARNING ITEMS

Read carefully the Safety and Important Warning Items described below to understand them before doing service work.

IMPORTANT NOTICE

Because of possible hazards to an inexperienced person servicing this product as well as the risk of damage to the product, KONICA MINOLTA BUSINESS TECHNOLOGIES, INC. (hereafter called the KMBT) strongly recommends that all servicing be performed only by KMBT-trained service technicians.
Changes may have been made to this product to improve its performance after this Service Manual was printed. Accordingly, KMBT does not warrant, either explicitly or implicitly, that the information contained in this Service Manual is complete and accurate.
The user of this Service Manual must assume all risks of personal injury and/or damage to the product while servicing the product for which this Service Manual is intended.
Therefore, this Service Manual must be carefully read before doing service work both in the course of technical training and even after that, for performing maintenance and control of the product properly.
Keep this Service Manual also for future service.

DESCRIPTION ITEMS FOR DANGER, WARNING AND CAUTION

In this Service Manual, each of three expressions "⚠ **DANGER**", "⚠ **WARNING**", and "⚠ **CAUTION**" is defined as follows together with a symbol mark to be used in a limited meaning.
When servicing the product, the relevant works (disassembling, reassembling, adjustment, repair, maintenance, etc.) need to be conducted with utmost care.

⚠ **DANGER: Action having a high possibility of suffering death or serious injury**

⚠ **WARNING: Action having a possibility of suffering death or serious injury**

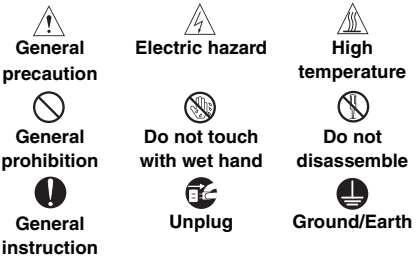
⚠ **CAUTION: Action having a possibility of suffering a slight wound, medium trouble, and property damage**

Symbols used for safety and important warning items are defined as follows:

△ **:Precaution when servicing the product.**

⃠ **:Prohibition when servicing the product.**

● **:Direction when servicing the product.**



SAFETY WARNINGS

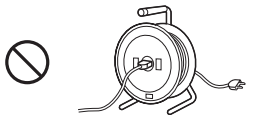
[1] MODIFICATIONS NOT AUTHORIZED BY KONICA MINOLTA BUSINESS TECHNOLOGIES, INC.

KONICA MINOLTA brand products are renowned for their high reliability. This reliability is achieved through high-quality design and a solid service network.
Product design is a highly complicated and delicate process where numerous mechanical, physical, and electrical aspects have to be taken into consideration, with the aim of arriving at proper tolerances and safety factors. For this reason, unauthorized modifications involve a high risk of degradation in performance and safety. Such modifications are therefore strictly prohibited. the points listed below are not exhaustive, but they illustrate the reasoning behind this policy.

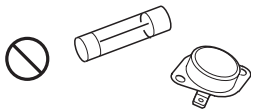
Prohibited Actions

⚠ DANGER

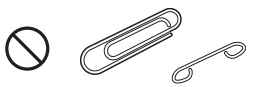
- Using any cables or power cord not specified by KMBT.



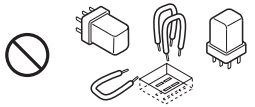
- Using any fuse or thermostat not specified by KMBT. Safety will not be assured, leading to a risk of fire and injury.



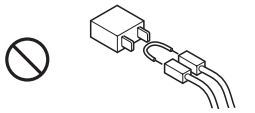
- Disabling fuse functions or bridging fuse terminals with wire, metal clips, solder or similar object.



- Disabling relay functions (such as wedging paper between relay contacts)

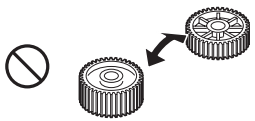


- Disabling safety functions (interlocks, safety circuits, etc.) Safety will not be assured, leading to a risk of fire and injury.



- Making any modification to the product unless instructed by KMBT

- Using parts not specified by KMBT



[2] POWER PLUG SELECTION

In some countries or areas, the power plug provided with the product may not fit wall outlet used in the area. In that case, it is obligation of customer engineer (hereafter called the CE) to attach appropriate power plug or power cord set in order to connect the product to the supply.

Power Cord Set or Power Plug

⚠ WARNING

- Use power supply cord set which meets the following criteria:
  - provided with a plug having configuration intended for the connection to wall outlet appropriate for the product's rated voltage and current, and
  - the plug has pin/terminal(s) for grounding, and
  - provided with three-conductor cable having enough current capacity, and
  - the cord set meets regulatory requirements for the area.

  Use of inadequate cord set leads to fire or electric shock.

- Attach power plug which meets the following criteria:
  - having configuration intended for the connection to wall outlet appropriate for the product's rated voltage and current, and
  - the plug has pin/terminal(s) for grounding, and
  - meets regulatory requirements for the area.

  Use of inadequate cord set leads to the product connecting to inadequate power supply (voltage, current capacity, grounding), and may result in fire or electric shock.

- Conductors in the power cable must be connected to terminals of the plug according to the following order:
  - Black or Brown: L (line)
  - White or Light Blue: N (neutral)
  - Green/Yellow: PE (earth)

  Wrong connection may cancel safeguards within the product, and results in fire or electric shock.

[3] CHECKPOINTS WHEN PERFORMING ON-SITE SERVICE

KONICA MINOLTA brand products are extensively tested before shipping, to ensure that all applicable safety standards are met, in order to protect the customer and customer engineer (hereafter called the CE) from the risk of injury. However, in daily use, any electrical equipment may be subject to parts wear and eventual failure. In order to maintain safety and reliability, the CE must perform regular safety checks.

1. Power Supply

Connection to Power Supply

⚠ WARNING

- Check that mains voltage is as specified.

  Connection to wrong voltage supply may result in fire or electric shock.

- Connect power plug directly into wall outlet having same configuration as the plug.

  Use of an adapter leads to the product connecting to inadequate power supply (voltage, current capacity, grounding), and may result in fire or electric shock.

  If proper wall outlet is not available, advice the customer to contact qualified electrician for the installation.

- Plug the power cord into the dedicated wall outlet with a capacity greater than the maximum power consumption.

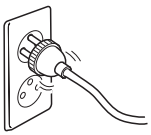
  If excessive current flows in the wall outlet, fire may result.

- If two or more power cords can be plugged into the wall outlet, the total load must not exceed the rating of the wall outlet.

  If excessive current flows in the wall outlet, fire may result.

- Make sure the power cord is plugged in the wall outlet securely.

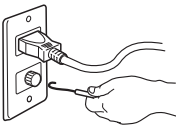
  Contact problems may lead to increased resistance, overheating, and the risk of fire.



- Check whether the product is grounded properly.

  If current leakage occurs in an ungrounded product, you may suffer electric shock while operating the product.

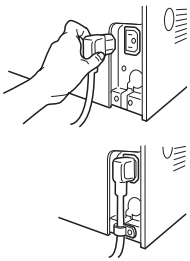
  Connect power plug to grounded wall outlet.



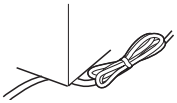
Power Plug and Cord

⚠ WARNING

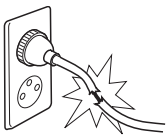
- When using the power cord set (inlet type) that came with this product, make sure the connector is securely inserted in the inlet of the product.
  When securing measure is provided, secure the cord with the fixture properly.
  If the power cord (inlet type) is not connected to the product securely, a contact problem may lead to increased resistance, overheating, and risk of fire.



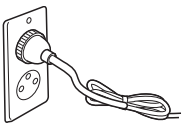
- Check whether the power cord is not stepped on or pinched by a table and so on.
  Overheating may occur there, leading to a risk of fire.



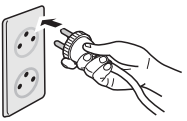
- Check whether the power cord is damaged. Check whether the sheath is damaged.
  If the power plug, cord, or sheath is damaged, replace with a new power cord (with plug and connector on each end) specified by KMBT. Using the damaged power cord may result in fire or electric shock.



- Do not bundle or tie the power cord.
  Overheating may occur there, leading to a risk of fire.

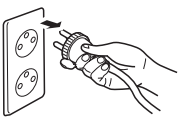


- Check whether dust is collected around the power plug and wall outlet.
  Using the power plug and wall outlet without removing dust may result in fire.



- Do not insert the power plug into the wall outlet with a wet hand.
  The risk of electric shock exists.

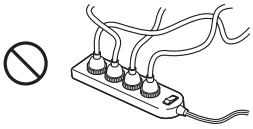
- When unplugging the power cord, grasp the plug, not the cable.
  The cable may be broken, leading to a risk of fire and electric shock.



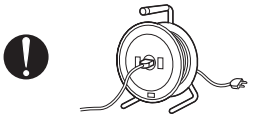
Wiring

⚠ WARNING

- Never use multi-plug adapters to plug multiple power cords in the same outlet.
  If used, the risk of fire exists.



- When an extension cord is required, use a specified one. Current that can flow in the extension cord is limited, so using a too long extension cord may result in fire.
  Do not use an extension cable reel with the cable taken up. Fire may result.

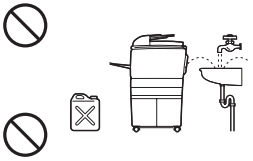


2. Installation Requirements

Prohibited Installation Places

⚠ WARNING

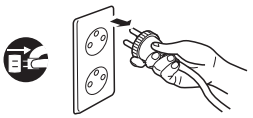
- Do not place the product near flammable materials or volatile materials that may catch fire.
  A risk of fire exists.
- Do not place the product in a place exposed to water such as rain.
  A risk of fire and electric shock exists.



When not Using the Product for a long time

⚠ WARNING

- When the product is not used over an extended period of time (holidays, etc.), switch it off and unplug the power cord.
  Dust collected around the power plug and outlet may cause fire.



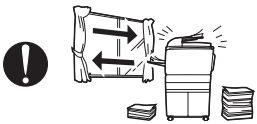
Ventilation

⚠ CAUTION

- The product generates ozone gas during operation, but it will not be harmful to the human body.

  If a bad smell of ozone is present in the following cases, ventilate the room.

  a. When the product is used in a poorly ventilated room
  b. When taking a lot of copies
  c. When using multiple products at the same time



Stability

⚠ CAUTION

- Be sure to lock the caster stoppers.

  In the case of an earthquake and so on, the product may slide, leading to a injury.

Inspection before Servicing

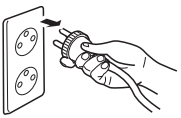
⚠ CAUTION

- Before conducting an inspection, read all relevant documentation (service manual, technical notices, etc.) and proceed with the inspection following the prescribed procedure, using only the prescribed tools. Do not make any adjustment not described in the documentation.

  If the prescribed procedure or tool is not used, the product may break and a risk of injury or fire exists.

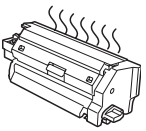
- Before conducting an inspection, be sure to disconnect the power plugs from the product and options.

  When the power plug is inserted in the wall outlet, some units are still powered even if the POWER switch is turned OFF. A risk of electric shock exists.



- The area around the fixing unit is hot.

  You may get burnt.

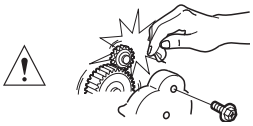


Work Performed with the Product Powered On

⚠ WARNING

- Take every care when making adjustments or performing an operation check with the product powered.

  If you make adjustments or perform an operation check with the external cover detached, you may touch live or high-voltage parts or you may be caught in moving gears or the timing belt, leading to a risk of injury.



- Take every care when servicing with the external cover detached.

  High-voltage exists around the drum unit. A risk of electric shock exists.

Safety Checkpoints

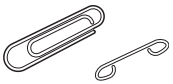
⚠ WARNING

- Check the exterior and frame for edges, burrs, and other damage.

  The user or CE may be injured.

- Do not allow any metal parts such as clips, staples, and screws to fall into the product.

  They can short internal circuits and cause electric shock or fire.



- Check wiring for squeezing and any other damage.

  Current can leak, leading to a risk of electric shock or fire.

- Carefully remove all toner remnants and dust from electrical parts and electrode units such as a charging corona unit.

  Current can leak, leading to a risk of product trouble or fire.

- Check high-voltage cables and sheaths for any damage.

  Current can leak, leading to a risk of electric shock or fire.

Safety Checkpoints

⚠ WARNING

- Check electrode units such as a charging corona unit for deterioration and sign of leakage.

  Current can leak, leading to a risk of trouble or fire.

- Before disassembling or adjusting the write unit (P/H unit) incorporating a laser, make sure that the power cord has been disconnected.

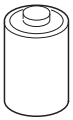
  The laser light can enter your eye, leading to a risk of loss of eyesight.

- Do not remove the cover of the write unit. Do not supply power with the write unit shifted from the specified mounting position.

  The laser light can enter your eye, leading to a risk of loss of eyesight.

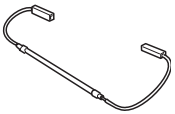
- When replacing a lithium battery, replace it with a new lithium battery specified in the Parts Guide Manual. Dispose of the used lithium battery using the method specified by local authority.

  Improper replacement can cause explosion.



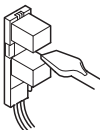
- After replacing a part to which AC voltage is applied (e.g., optical lamp and fixing lamp), be sure to check the installation state.

  A risk of fire exists.



- Check the interlock switch and actuator for loosening and check whether the interlock functions properly.

  If the interlock does not function, you may receive an electric shock or be injured when you insert your hand in the product (e.g., for clearing paper jam).



- Make sure the wiring cannot come into contact with sharp edges, burrs, or other pointed parts.

  Current can leak, leading to a risk of electric shock or fire.

Safety Checkpoints

⚠ WARNING

- Make sure that all screws, components, wiring, connectors, etc. that were removed for safety check and maintenance have been reinstalled in the original location. (Pay special attention to forgotten connectors, pinched cables, forgotten screws, etc.)

  A risk of product trouble, electric shock, and fire exists.

Handling of Consumables

⚠ WARNING

- Toner and developer are not harmful substances, but care must be taken not to breathe excessive amounts or let the substances come into contact with eyes, etc. It may be stimulative.

  If the substances get in the eye, rinse with plenty of water immediately. When symptoms are noticeable, consult a physician.

- Never throw the used cartridge and toner into fire.

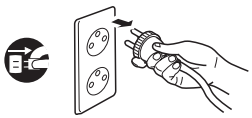
  You may be burned due to dust explosion.

Handling of Service Materials

⚠ CAUTION

- Unplug the power cord from the wall outlet.

  Drum cleaner (isopropyl alcohol) and roller cleaner (acetone-based) are highly flammable and must be handled with care. A risk of fire exists.



- Do not replace the cover or turn the product ON before any solvent remnants on the cleaned parts have fully evaporated.

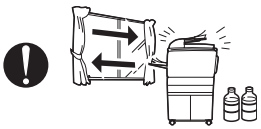
  A risk of fire exists.

Handling of Service Materials

⚠ CAUTION

- Use only a small amount of cleaner at a time and take care not to spill any liquid. If this happens, immediately wipe it off.
  A risk of fire exists.

- When using any solvent, ventilate the room well.
  Breathing large quantities of organic solvents can lead to discomfort.



[4] Used Batteries Precautions

ALL Areas

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions.

Germany

VORSICHT!

Explosionsgefahr bei unsachgemäßem Austausch der Batterie.
Ersatz nur durch denselben oder einen vom Hersteller empfohlenen gleichwertigen Typ.
Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

France

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie.
Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur.
Mettre au rebut les batteries usagées conformément aux instructions du fabricant.

Denmark

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

Finland, Sweden

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

VARNING

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens instruktion.

Norway

ADVARSEL

Eksplosjonsfare ved feilaktig skifte av batteri.
Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten.
Brukte batterier kasseres i henhold til fabrikantens instruksjoner.

[5] Laser Safety

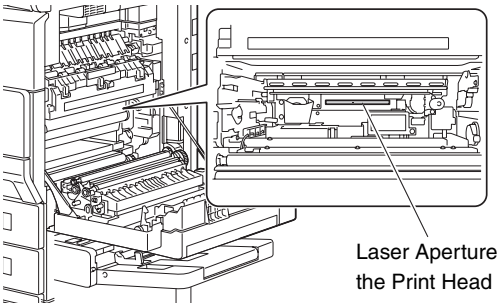
- This is a digital machine certified as a class 1 laser product. There is no possibility of danger from a laser, provided the machine is serviced according to the instruction in this manual.

5.1 Internal Laser Radiation

Semiconductor laser	
Maximum average radiation power(*)	28.9 µW
Wavelength	770-795 nm

*:Laser Aperture of the Print Head Unit

- This product employs a Class 3b laser diode that emits an invisible laser beam. The laser diode and the scanning polygon mirror are incorporated in the print head unit.
- The print head unit is NOT A FIELD SERVICE ITEM. Therefore, the print head unit should not be opened under any circumstances.



the U.S.A., Canada (CDRH Regulation)

- This machine is certified as a Class I Laser product under Radiation Performance Standard according to the Food, Drug and Cosmetic Act of 1990. Compliance is mandatory for Laser products marketed in the United States and is reported to the Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration of the U.S. Department of Health and Human Services (DHHS). This means that the device does not produce hazardous laser radiation.
- The label shown to page S-16 indicates compliance with the CDRH regulations and must be attached to laser products marketed in the United States.

⚠ CAUTION

- **Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.**

Semiconductor laser	
Maximum power of the laser diode	5 mW
Wavelength	770-795 nm

All Areas

⚠ CAUTION

- **Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.**

Semiconductor laser	
Maximum power of the laser diode	5 mW
Wavelength	770-795 nm

Denmark

⚠ ADVARSEL

- **Usynlig Laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling. Klasse 1 laser produkt der opfylder IEC60825 sikkerheds kravene.**

Halvlederlaser	
Laserdiodens højeste styrke	5 mW
Bølgelængden	770-795 nm

Finland, Sweden

⚠ VARO!

- **Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.**

LOUKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

⚠ VAROITUS!

- **Laitteen Käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.**

Puolijohdelaser	
Laserdiodin suurin teho	5 mW
Aallonpituus	770-795 nm

⚠ VARNING!

- **Om apparaten används på annat sätt än i denna bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.**

Halvledarlaser	
Den maximala effekten för laserdioden	5 mW
Våglängden	770-795 nm

⚠ VARNING!

- **Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.**

Norway

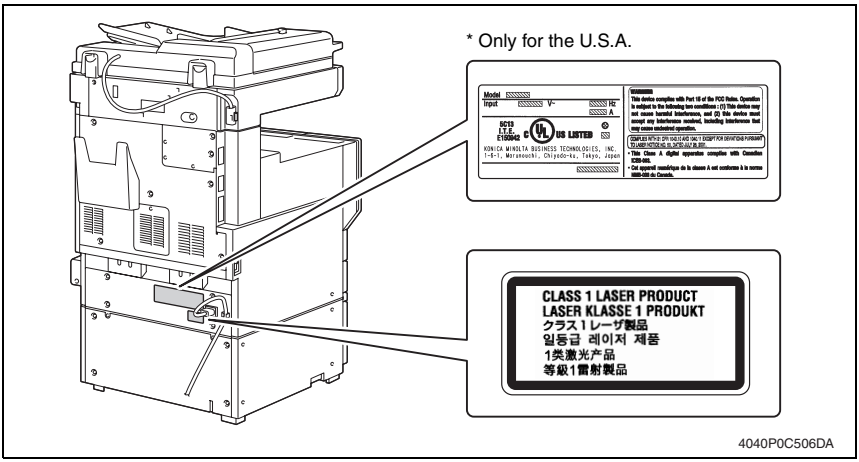
⚠ ADVERSEL

- **Dersom apparatet brukes på annen måte enn spesifisert i denne bruksanvisning, kan brukeren utsettes for unsynlig laserstråling som overskrider grensen for laser klass 1.**

Halvleder laser	
Maksimal effekt till laserdiode	5 mW
Bølgelengde	770-795 nm

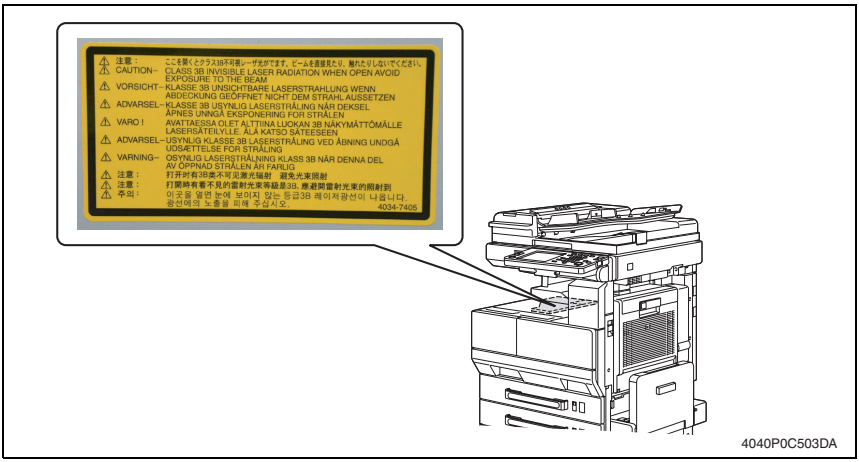
5.2 Laser Safety Label

- A laser safety labels is attached to the outside of the machine as shown below.



5.3 Laser Caution Label

- A laser caution label is attached to the inside of the machine as shown below.

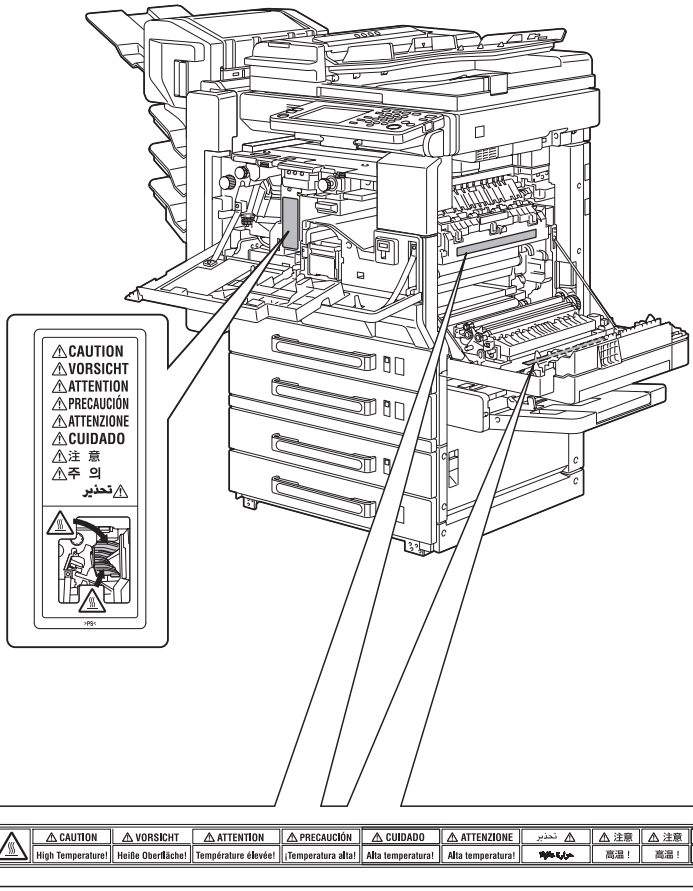

CAUTION– CLASS 3B INVISIBLE LASER RADIATION WHEN OPEN AVOID EXPOSURE TO THE BEAM
VORSICHT– KLASSE 3B UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFNET NICHT DEM STRAHL AUSSETZEN
ADVARSEL– KLASSE 3B USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN
VARO ! AVATTAESSA OLET ALTTIINA LUOKAN 3B NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN
ADVARSEL– USYNLIG KLASSE 3B LASERSTRÅLING VED ÅBNING UNDGÅ UDSÆTTELSE FOR STRÅLING
VARNING– OSYNLIG LASERSTRÅLNING KLASS 3B NÄR DENNA DEL AV OPPNAD STRÅLEN ÄR FARLIG
4034-7405
4040P0C503DA

5.4 Precautions For Handling The Laser Equipment

- When laser protective goggles are to be used, select ones with a lens conforming to the above specifications.
- When a disassembly job needs to be performed in the laser beam path, such as when working around the printerhead and PC Drum, be sure first to turn the copier OFF.
- If the job requires that the copier be left ON, take off your watch and ring and wear laser protective goggles.
- A highly reflective tool can be dangerous if it is brought into the laser beam path. Use utmost care when handling tools on the user's premises.

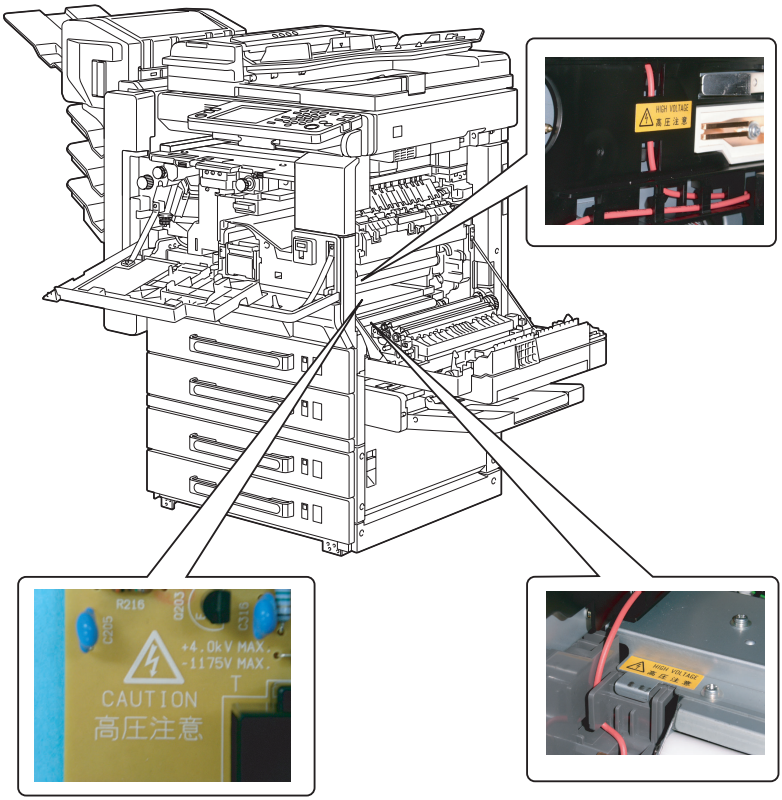
WARNING INDICATIONS ON THE MACHINE

Caution labels shown are attached in some areas on/in the machine.
When accessing these areas for maintenance, repair, or adjustment, special care should be taken to avoid burns and electric shock.



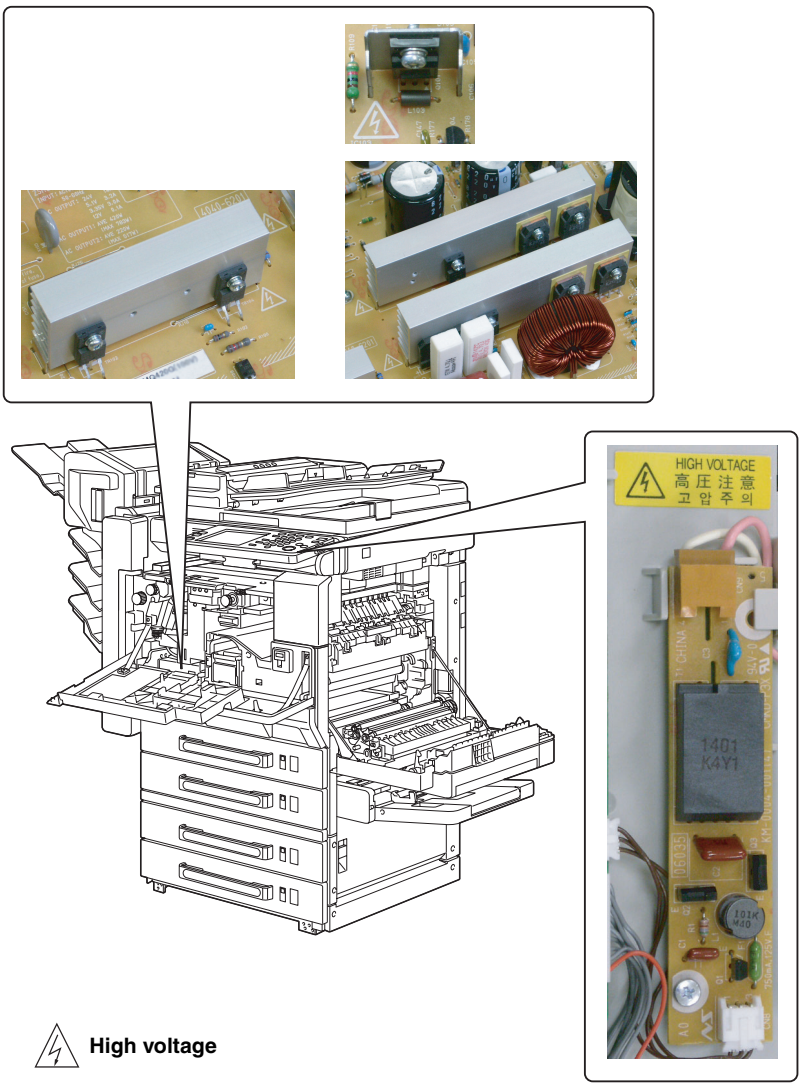
CAUTION

4040P0C500DA



High voltage

4040P0C501DA



⚠ CAUTION:

- **You may be burned or injured if you touch any area that you are advised not to touch by any caution label. Do not remove caution labels. If any caution label has come off or soiled and therefore the caution cannot be read, contact our Service Office.**

MEASURES TO TAKE IN CASE OF AN ACCIDENT

1. If an accident has occurred, the distributor who has been notified first must immediately take emergency measures to provide relief to affected persons and to prevent further damage.
2. If a report of a serious accident has been received from a customer, an on-site evaluation must be carried out quickly and KMBT must be notified.
3. To determine the cause of the accident, conditions and materials must be recorded through direct on-site checks, in accordance with instructions issued by KMBT.
4. For reports and measures concerning serious accidents, follow the regulations specified by every distributor.

Composition of the service manual

This service manual consists of Theory of Operation section and Field Service section to explain the main machine and its corresponding options.

Theory of Operation section gives, as information for the CE to get a full understanding of the product, a rough outline of the object and role of each function, the relationship between the electrical system and the mechanical system, and the timing of operation of each part.

Field Service section gives, as information required by the CE at the site (or at the customer's premise), a rough outline of the service schedule and its details, maintenance steps, the object and role of each adjustment, error codes and supplementary information.

The basic configuration of each section is as follows. However some options may not be applied to the following configuration.

<Theory of Operation section>

OUTLINE:	Explanation of system configuration, product specifications, unit configuration, and paper path
COMPOSITION/OPERATION:	Explanation of configuration of each unit, operating system, and control system

<Field service section>

OUTLINE:	Explanation of system configuration, and product specifications
MAINTENANCE:	Explanation of service schedule, maintenance steps, service tools, removal/reinstallation methods of major parts, and firmware version up method etc.
ADJUSTMENT/SETTING:	Explanation of utility mode, service mode, and mechanical adjustment etc.
TROUBLESHOOTING:	Explanation of lists of jam codes and error codes, and their countermeasures etc.
APPENDIX:	Parts layout drawings, connector layout drawings, timing chart, overall layout drawing are attached.

Notation of the service manual

A. Product name

In this manual, each of the products is described as follows:

(1)	IC board:	Standard printer
(2)	bizhub 200/250/350:	Main body
(3)	Microsoft Windows 95:	Windows 95
	Microsoft Windows 98:	Windows 98
	Microsoft Windows Me:	Windows Me
	Microsoft Windows NT 4.0:	Windows NT 4.0 or Windows NT
	Microsoft Windows 2000:	Windows 2000
	Microsoft Windows XP:	Windows XP
	When the description is made in combination of the OS's mentioned above:	
		Windows 95/98/Me
		Windows NT 4.0/2000
		Windows NT/2000/XP
		Windows 95/98/Me/ NT/2000/XP

B. Brand name

The company names and product names mentioned in this manual are the brand name or the registered trademark of each company.

KONICA MINOLTA

SERVICE MANUAL THEORY OF OPERATION

bizhub Main Unit
200 / 250 / 350

2005.08
KONICA MINOLTA BUSINESS TECHNOLOGIES, INC. Ver. 1.0

Revision history

After publication of this service manual, the parts and mechanism may be subject to change for improvement of their performance.
Therefore, the descriptions given in this service manual may not coincide with the actual machine.

When any change has been made to the descriptions in the service manual, a revised version will be issued with a revision mark added as required.

Revision mark:

- To indicate clearly a section revised, show to the left of the revised section.
  A number within represents the number of times the revision has been made.

- To indicate clearly a section revised, show in the lower outside section of the corresponding page.
  A number within represents the number of times the revision has been made.

NOTE

Revision marks shown in a page are restricted only to the latest ones with the old ones deleted.

- When a page revised in Ver. 2.0 has been changed in Ver. 3.0:
  The revision marks for Ver. 3.0 only are shown with those for Ver. 2.0 deleted.
- When a page revised in Ver. 2.0 has not been changed in Ver. 3.0:
  The revision marks for Ver. 2.0 are left as they are.

2005/08	1.0	—	Issue of the first edition
Date	Service manual Ver.	Revision mark	Descriptions of revision

CONTENTS

bizhub 200/250/350 Main Unit

Outline

1. System configuration 1
2. Product specifications 3
3. Built-in Controllers 5
4. Center cross section 6
5. Paper path 7
6. Image creation process 8

Composition/Operation

7. Overall composition 9
7.1 Timing chart at machine power up 9
7.2 Control block diagram 10
8. Scanner section (IR section) 11
8.1 Composition 11
8.2 Drive 12
8.3 Operation 13
8.3.1 Scan and Exposure Lamp control 13
8.3.2 Original Size Detection control 14
9. Write section (PH section) 16
9.1 Composition 16
9.2 Operation 17
9.2.1 Laser exposure process 17
9.2.2 Laser emission timing 17
9.2.3 Advance Polygon Rotation 17
9.2.4 Laser Shutter Mechanism 18
9.2.5 Laser emission area 18
10. Imaging Unit section (IU section) 20
10.1 Composition 20
10.2 Drive 21
10.3 Operation 22
10.3.1 Outline 22
10.3.2 IU Life control 22
11. Photo Conductor section 24
11.1 Composition 24
11.2 Drive 25

11.3 Operation ... 26
11.3.1 Photo Conductor cleaning mechanism ... 26
12. Charge Corona section ... 27
12.1 Operation ... 27
12.1.1 Charge Corona ON/OFF control ... 27
13. Developing section ... 28
13.1 Composition ... 28
13.2 Drive ... 29
13.3 Operation ... 30
13.3.1 Developing Drive control ... 30
13.3.2 Developer flow ... 30
13.3.3 Developing Roller ... 31
13.3.4 Developing bias ... 32
13.3.5 HMT (High grade Micro Toning) development ... 32
13.3.6 Developer Scattering Preventive Mechanism ... 33
13.3.7 ATDC (TCR) Sensor control ... 34
14. Toner Supply section ... 35
14.1 Composition ... 35
14.2 Drive ... 35
14.3 Operation ... 36
14.3.1 Toner Replenishing/control ... 36
14.3.2 Toner Near-Empty and Toner Empty detection control ... 41
15. Transfer Corona section ... 42
15.1 Composition ... 42
15.2 Drive ... 43
15.3 Operation ... 43
15.3.1 Transfer Mechanism ... 43
15.3.2 Transfer Roller Cleaning ... 43
15.3.3 Charge neutralization and separation of paper ... 44
16. Toner Collecting section ... 45
16.1 Composition ... 45
16.2 Drive ... 45
16.3 Operation ... 46
16.3.1 Toner recycling mechanism ... 46
17. Paper feed section ... 47
17.1 Composition ... 47
17.1.1 Tray1 ... 47
17.1.2 Tray2 ... 48
17.2 Drive ... 49

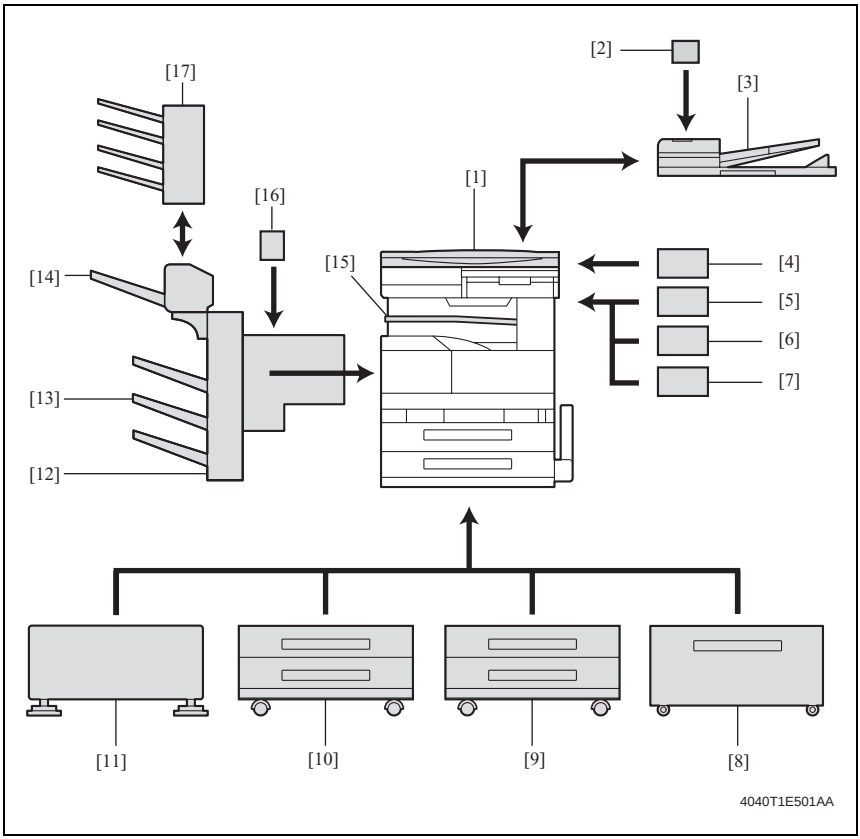
17.2.1 Tray1 49
17.2.2 Tray2 49
17.3 Operation 50
17.3.1 Paper Feed control (Tray1) 50
17.3.2 Paper Feed control (Tray2) 50
17.3.3 Paper Feed Mechanism 51
17.3.4 Paper Near-Empty/Paper Empty detection 52
17.3.5 Tray ascent operation 52
17.3.6 Paper size detection 53
17.3.7 ON/OFF positions of Paper Size Detecting Switches/Sensors and Corresponding Paper Size Detected 54
17.3.8 Paper level indicator mechanism 55
17.3.9 Paper feed retry control 55
18. Bypass section 56
18.1 Composition 56
18.2 Drive 57
18.3 Operation 57
18.3.1 Bypass Paper Feed control 57
18.3.2 Paper Empty detection 58
18.3.3 Bypass Paper Lifting Motion Control 59
18.3.4 Paper size detection 60
19. Synchronizing Roller/Conveyance section 61
19.1 Composition 61
19.2 Drive 61
19.3 Operation 62
20. Fusing section 63
20.1 Composition 63
20.2 Drive 64
20.3 Operation 65
20.3.1 Fusing Roller drive control 65
20.3.2 Fusing temperature control 65
20.3.3 Protection against abnormal conditions 68
21. Paper exit section 70
21.0.1 Composition 70
21.1 Drive 70
22. Image stabilization control 71
22.1 Overview 71
23. Image processing 72
23.1 Scanner section image processing block diagram 72

23.2 Write section image processing block diagram 1 73
24. Other control 74
24.1 Fan control 74
24.1.1 Construction 74
24.1.2 Operation 75
24.2 Parts Operated When the Power Switch and Auxiliary Power Button are turned ON 76
24.2.1 Parts operated when the Power Switch and Auxiliary Power Button are turned ON 76
24.3 Counter control 77
24.3.1 Construction 77

Outline

1. System configuration

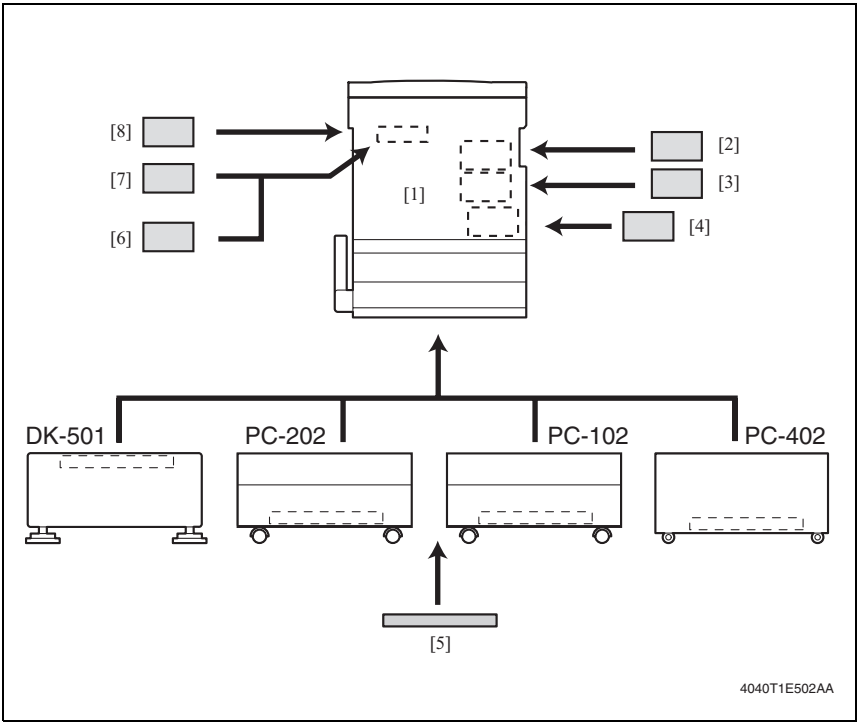
1/2 System Front View



[1] Original Cover (OC-502)
[2] Stamp Unit (SP-501)
[3] Reverse Automatic Document Feeder (DF-605)
[4] Data Controller (D-103)
[5] Key Counter Kit 4
[6] Key Counter *1
[7] Key Counter Mount Kit *2
[8] Paper Feed Cabinet (PC-402)
[9] Paper Feed Cabinet (PC-202)
[10] Paper Feed Cabinet (PC-102)
[11] Desk (DK-501)
[12] Finisher (FS-508)
[13] Output Tray (OT-601)
[14] Saddle Sticher (SD-502)
[15] Job Separator (JS-502)
[16] Punch Unit (PU-501)
[17] Mailbin Kit (MT-501)

*1: Key Counter Only
*2: Mount Plate Only

2/2 System Rear View



[1]	Machine	[5]	Dehumidifier Heater 1C
[2]	Fax Kit (FK-503)	[6]	Scanner Unit (SU-501) *2
[3]	Fax Multi Line (ML-502)	[7]	Expanded Memory Unit (EM-303/EM-304/EM-305) *2
[4]	Local Interface kit (EK-502)	[8]	Hard Disk (HD-504)

*1: The Expanded Memory Unit and Scanner Unit cannot be mounted at the same time.

2. Product specifications

A. Type

Type	Desktop/Console (dedicated cabinet or dedicated table)
Copying System	Electrostatic dry powdered image transfer to plain paper
PC Drum Type	OPC (organic photo conductor)
Scanning Density	Equivalent to 600 dpi
Exposure Lamp	Cold-cathode tube
Print Density	Main scan: 600 dpi; sub-scan: 600 dpi
Platen	Stationary (mirror scan)
Original Scanning	Scanning in main scanning direction with a CCD
Registration	Rear left edge
Paper Feeding System (Standard) Three-way system	Multiple Bypass: 150 sheets Tray1: 500 sheets Tray2: 500 sheets
Exposure System	Electrostatic dry powdered image transfer to plain paper with a laser
Developing System	HMT developing system
Charging System	Comb electrode with scorotron system
Image Transfer System	Image transfer roller system
Paper Separating System	Separator fingers
Fusing System	Heat roller

B. Functions

Types of Original	Sheets, books, and three-dimensional objects	
Max. Original Size	A3 or 11 × 17	
Multiple Copies	1 to 999	
Warming-up Time	14 sec. or less (when the Auxiliary Power Switch is turned ON from a stabilized state, in which the Main Power Switch is ON and Auxiliary Power Switch is OFF, with the rated power source voltage and at a room temperature of 23 °C)	
Image Loss	Leading edge: 4 mm (1/4 inch), Trailing edge: 4 mm (1/4 inch), Rear edge: 4 mm (1/4 inch), Front edge: 4 mm (1/4 inch)	
First Copy Time (Tray1, A4, full size)	4.8 sec. or less (bizhub 350)	
	5.3 sec. or less (bizhub 250)	
	5.3 sec. or less (bizhub 200)	
System Speed	160 m/s (bizhub 350)	
	140 m/s (bizhub 250, bizhub 200)	
Copying Speed for Multi-copy Cycle (A4, 8-1/2 × 11)	35 copies/min (bizhub 350)	
	25 copies/min (bizhub 250)	
	20 copies/min (bizhub 200)	
Fixed Zoom Ratios	Full size	×1.000
	Reduction	Metric Area: ×0.500, ×0.707, ×0.816, ×0.930 Inch Area: ×0.500, ×0.647, ×0.733, ×0.785, ×0.930
	Enlargement	Metric Area: ×1.154, ×1.414, ×2.000 Inch Area: ×1.214, ×1.294, ×1.545, ×2.000
Variable Zoom Ratios	×0.250 to ×4.000	in 0.001 increments

C. Types of Paper

Paper Source		Paper Source		
		Tray1	Tray2	Multiple Bypass
Copy paper type	Plain paper (56 to 90 g/m² / 15 to 24 lb)	❍	❍	❍
	Translucent paper	-	-	-
	OHP transparencies	-	-	❍
	Thick paper (91 to 210 g/m² / 24-1/4 to 55-3/4 lb)	-	-	❍
	Postcards	-	-	❍
	Envelopes	-	-	❍
	Labels	-	-	❍
	Thin Paper (50 to 55 g/m² / 13-1/4 to 14-3/4 lb)	-	-	❍
Copy paper dimensions	Max. (width × length)	297 to 420 mm 11.5 × 16.5 inches		297 to 432 mm 11 × 17 inches
	Min. (width × length)	148 to 210 mm 5.75 × 8.25 inches		90 to 140 mm 3.5 × 5.5 inches

❍: Reliably fed - : Feeding prohibited

D. Maintenance

Machine Durability	1200,000 prints or 5 years, whichever is earlier (bizhub 350) 800,000 prints or 5 years, whichever is earlier (bizhub 250) 500,000 prints or 5 years, whichever is earlier (bizhub 200)

E. Machine Specifications

Power Requirements	Voltage	AC 120 V, 220 - 240 V
	Frequency	50/60 Hz
Max Power Consumption	120 V: 1380 W ± 10 % 200 V: 1300 - 1470 W ± 10 %	
Dimensions	677 (W) × 710 (D) × 718 (H) mm	
Space Requirements	687 (W) × 710 (D) mm *1	
Mass	74 kg (including the Duplex Unit, Switchback Unit, and Imaging Unit)	

*1: Space requirements represent the dimensions of the machine when the Multi Bypass Tray is lowered.

F. Operating Environment

Temperature	10 to 32 °C / 50 to 89.6 °F (with a fluctuation of 10 °C / 18 °F or less per hour)
Humidity	15 to 85 % (with a fluctuation of 20 %/h)

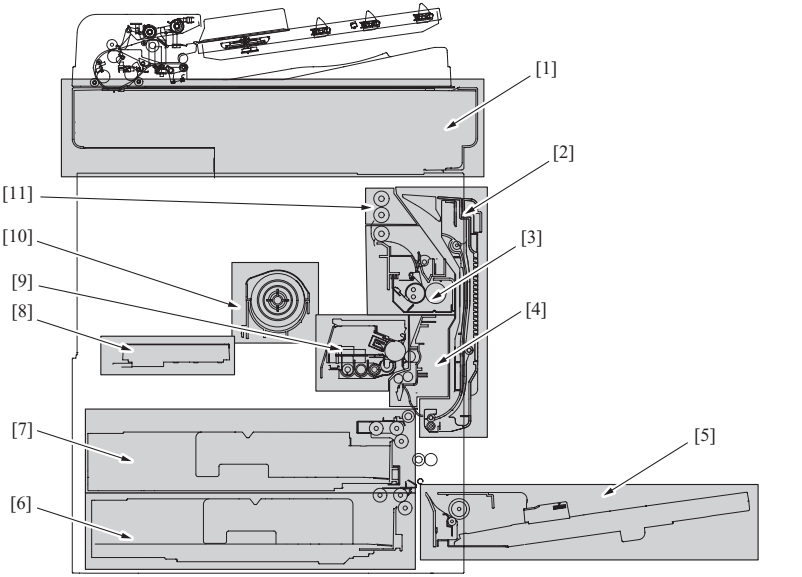
3. Built-in Controllers

Type	Built-in type controller	
CPU	RM5231	
Printer Driver	PCL5e Emulation PCL6 (XL Ver. 2.1) Emulation PostScript3 Emulation (3011.xx.xx)	
Scan Driver	TWAIN driver	
OS Compatibility	Server	Windows NT4.0 sp6 / 2000 / 2003
	Client	Windows 98SE / Me Windows 2000 / XP Windows NT4.0 sp6 Linux (2nd-compliant) Macintosh OS 9.2 or later / OS X 10.2 or later
Interface	Ethernet (10 Base-T/100 Base-TX) USB 2.0/1.1	

NOTE

- These specifications are subject to change without notice.

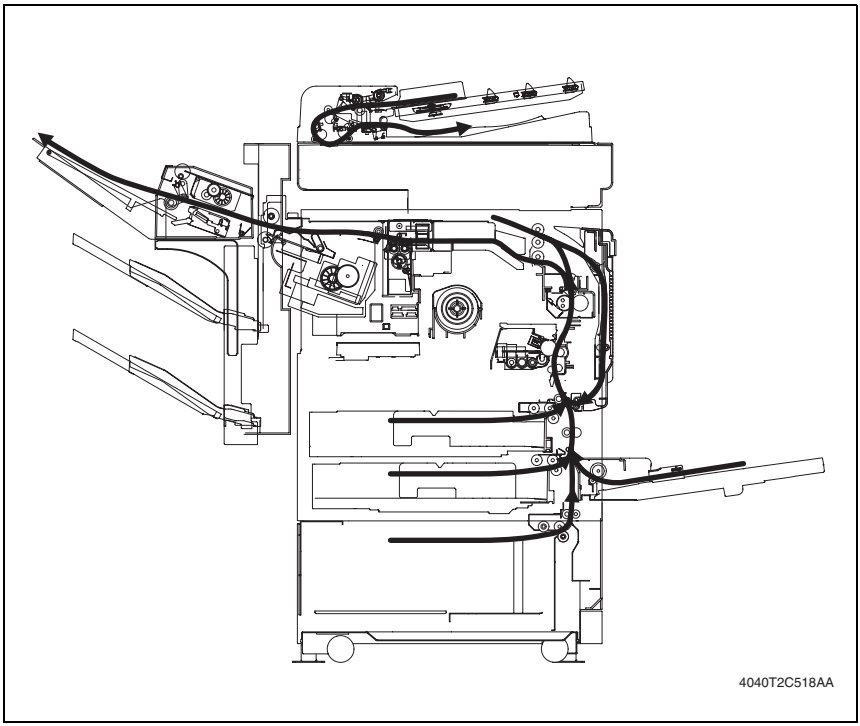
4. Center cross section



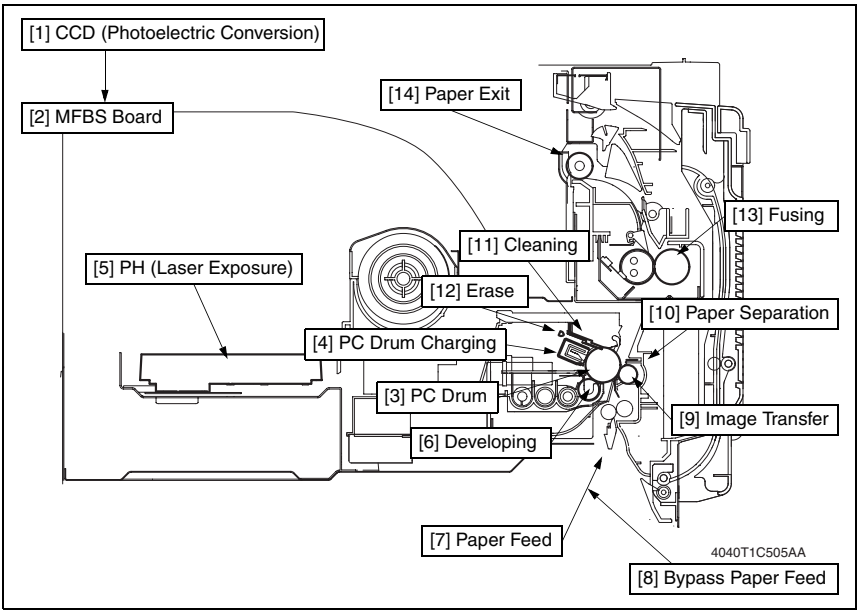
[1] Scanner Section
[2] Duplex Unit
[3] Fusing Unit
[4] Transfer Roller Unit Section
[5] Multiple Bypass Unit
[6] Tray2
[7] Tray1
[8] PH Unit
[9] Imaging Unit (IU)
[10] Toner Bottle/Toner Hopper Section
[11] Switchback Unit

5. Paper path

- Machine equipped with a DF-605, FS-508, SD-502, and PC-402



6. Image creation process

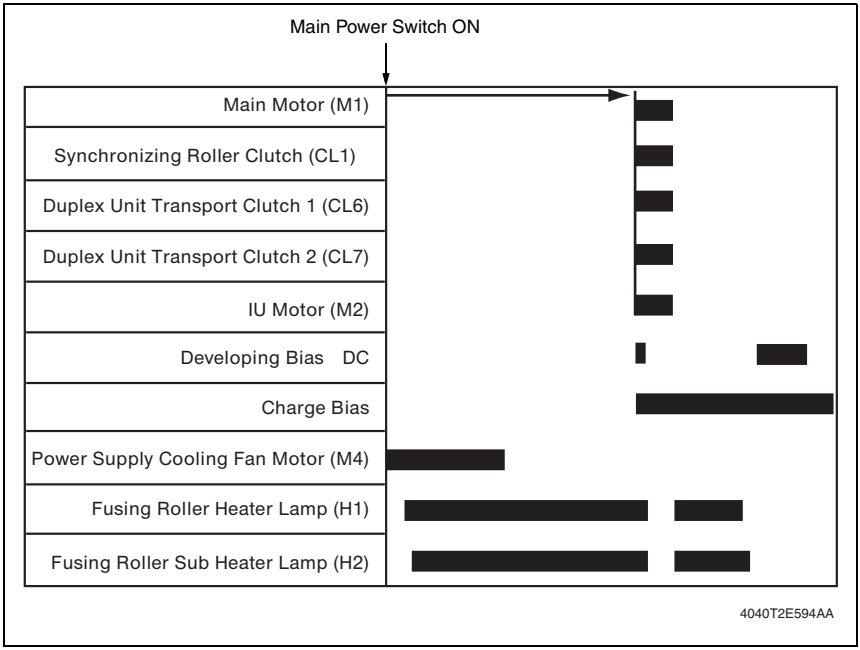


[1]	CCD (Photoelectric Conversion)	• Light reflected off the surface of the original is converted to a corresponding electric signal by CCD and the resultant electric signal is sent to the MFBS Board.
[2]	MFBS Board	• MFBS Board performs image processing.
[3]	PC Drum	• The image of the original projected onto the surface of the PC Drum is changed to a corresponding electrostatic latent image.
[4]	PC Drum Charging	• Supply DC (-) charge on the PC Drum.
[5]	PH (Laser Exposure)	• Expose photo conductor to a laser beam to develop electrostatic latent image.
[6]	Developing	• The toner, agitated and negatively charged in the Developer Mixing Chamber, is attracted onto the electrostatic latent image formed on the surface of the PC Drum. It is thereby changed to a visible, developed image.
[7]	Paper Feed	• Paper is supplied from the paper feed cassette.
[8]	Bypass Paper Feed	• Paper is supplied from the bypass paper feed tray.
[9]	Image Transfer	• A DC positive charge is applied to the Image Transfer Roller to transfer the visible image on the surface of the PC Drum onto the paper.
[10]	Paper Separation	• The PC Drum Paper Separator Fingers remove paper from the surface of the PC Drum.
[11]	Cleaning	• The residual toner left on the surface of the PC Drum is scraped off.
[12]	Erase	• The surface of the PC Drum is irradiated with light, which neutralizes any surface potential remaining on the surface of the PC Drum.
[13]	Fusing	• Toner is permanently fused to the paper by the combination of heat and pressure applied by the Fusing Roller.
[14]	Paper Exit	• The paper is fed out face down onto the Exit Tray.

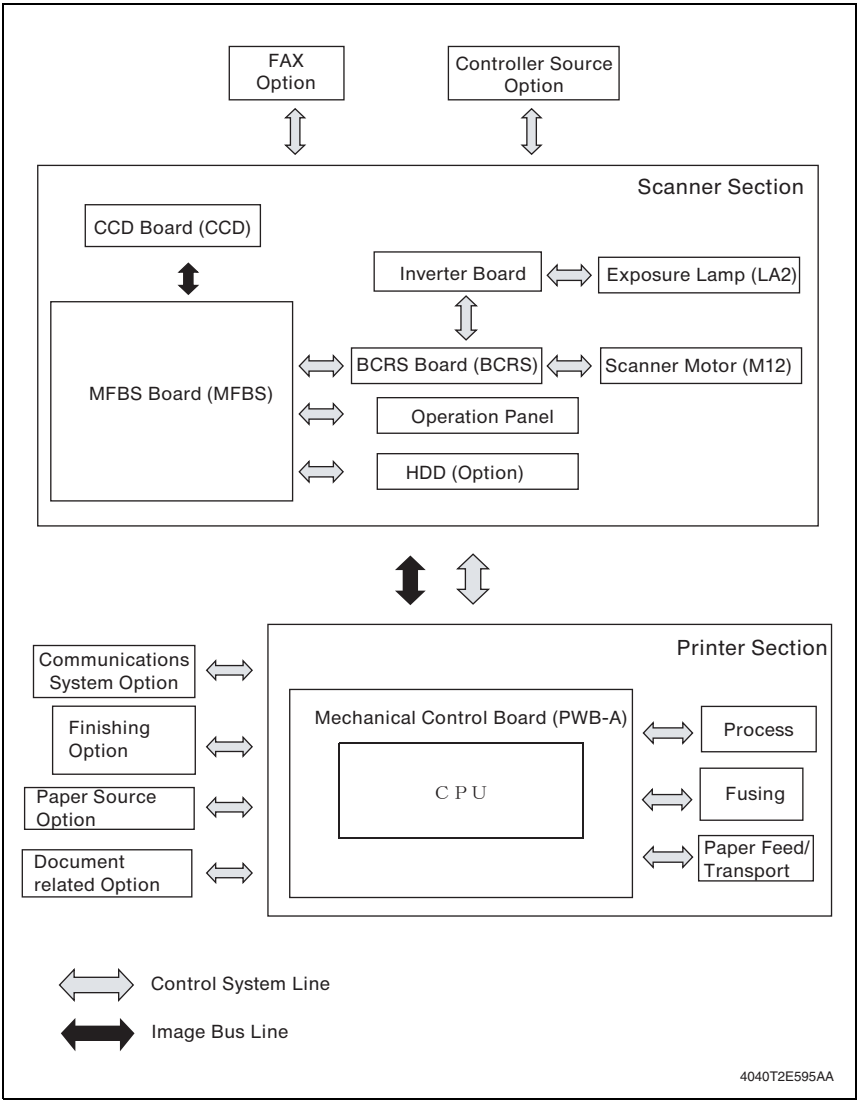
Composition/Operation

7. Overall composition

7.1 Timing chart at machine power up

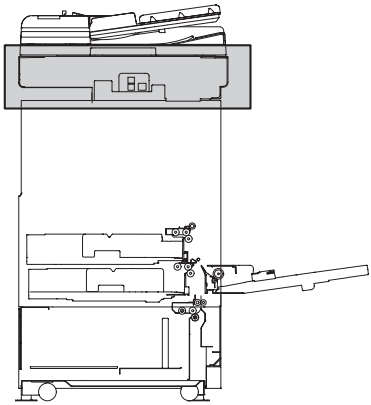

Main Power Switch ON
Main Motor (M1)
Synchronizing Roller Clutch (CL1)
Duplex Unit Transport Clutch 1 (CL6)
Duplex Unit Transport Clutch 2 (CL7)
IU Motor (M2)
Developing Bias DC
Charge Bias
Power Supply Cooling Fan Motor (M4)
Fusing Roller Heater Lamp (H1)
Fusing Roller Sub Heater Lamp (H2)
4040T2E594AA

7.2 Control block diagram

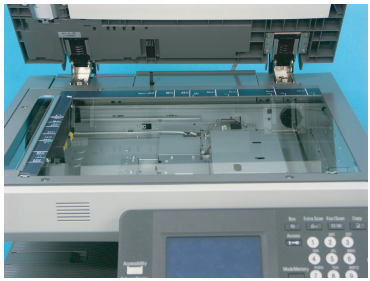


8. Scanner section (IR section)

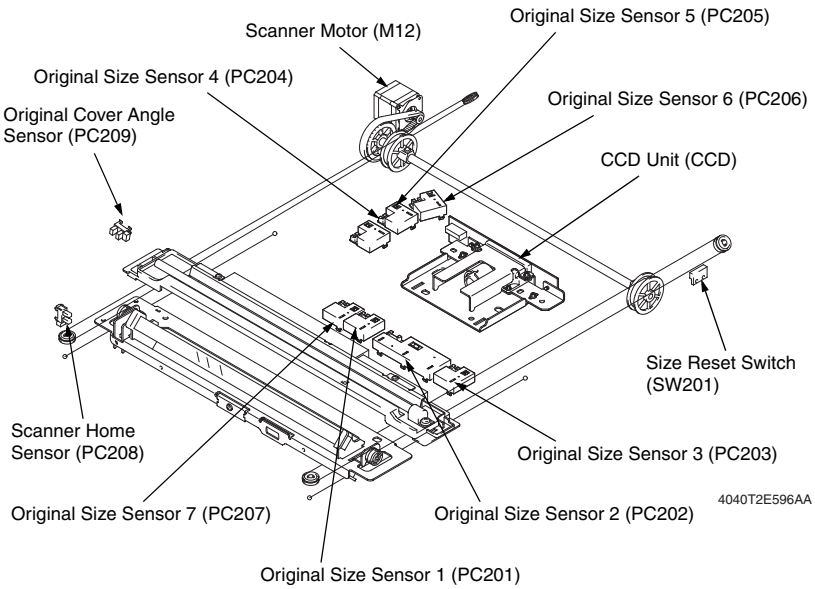
8.1 Composition



4040T2C507AA

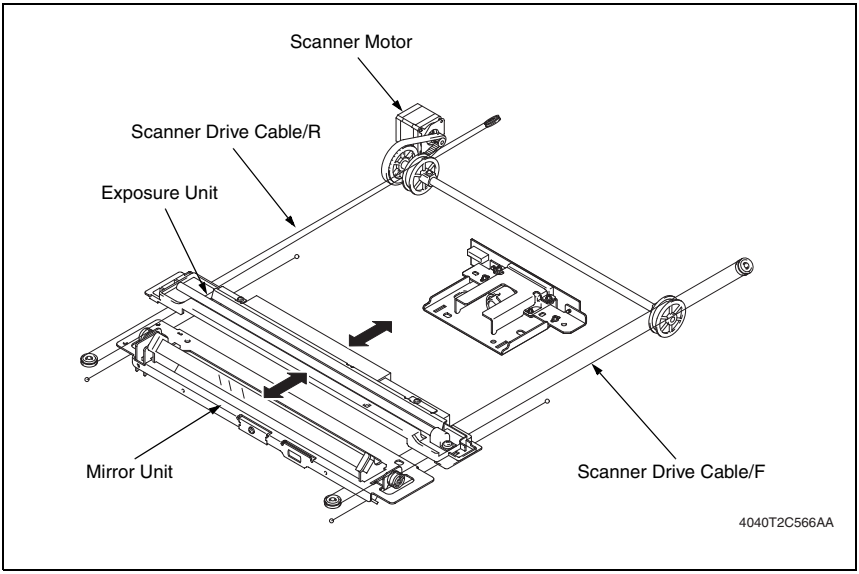


4040T2C581AA


Scanner Motor (M12)
Original Size Sensor 5 (PC205)
Original Size Sensor 4 (PC204)
Original Size Sensor 6 (PC206)
Original Cover Angle Sensor (PC209)
CCD Unit (CCD)
Size Reset Switch (SW201)
Scanner Home Sensor (PC208)
Original Size Sensor 3 (PC203)
Original Size Sensor 7 (PC207)
Original Size Sensor 2 (PC202)
Original Size Sensor 1 (PC201)

4040T2E596AA

8.2 Drive


Scanner Motor
Scanner Drive Cable/R
Exposure Unit
Mirror Unit
Scanner Drive Cable/F
4040T2C566AA

8.3 Operation

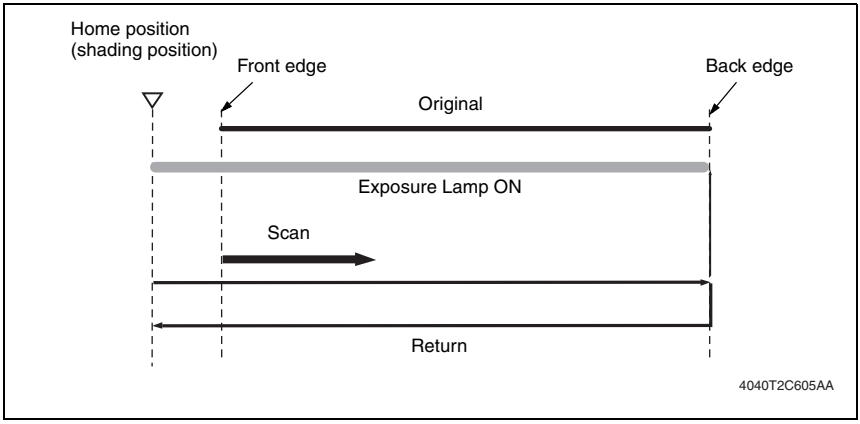
8.3.1 Scan and Exposure Lamp control

A. When the Main and Auxiliary Power Switches are ON

- When both the Main Power Switch and Auxiliary Power Switch are ON, the Exposure Unit remains stationary at its home position (shading position).

B. When the Start key is pressed

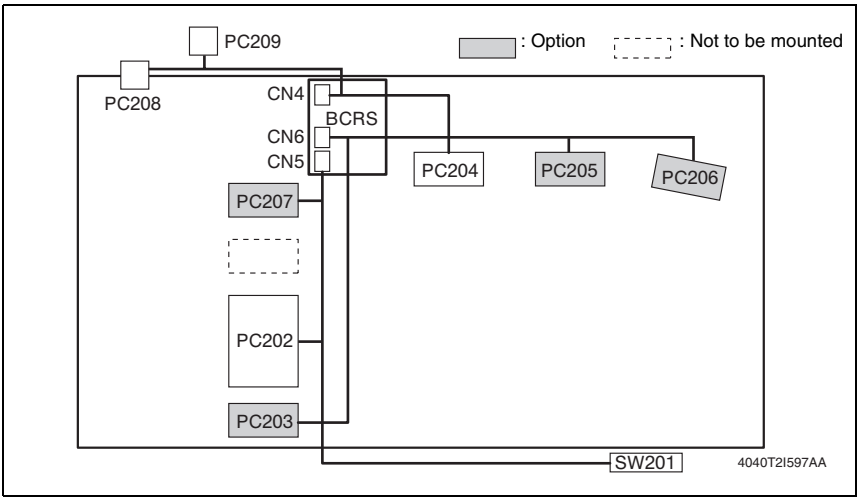
1. Turning the START key ON will turn the Exposure Lamp ON.
2. A shading correction is made. (The Exposure Unit remains stationary at its home position (shading position).)
3. The Exposure Unit moves from the shading position to the image leading edge position (by moving in the scan direction).
4. The Exposure Unit will move from the front edge to the back edge of the image to scan.
   The exposure unit will start reading the original image from the front edge.
   The unit will finish reading the image at the back edge of the image.
5. The Exposure Lamp will be OFF when the reading is complete.
   The Scanner Cooling Fan Motor (M202) will stop.
6. The exposure unit will move from the home position to the front edge of the image in scanning direction and stop.



8.3.2 Original Size Detection control

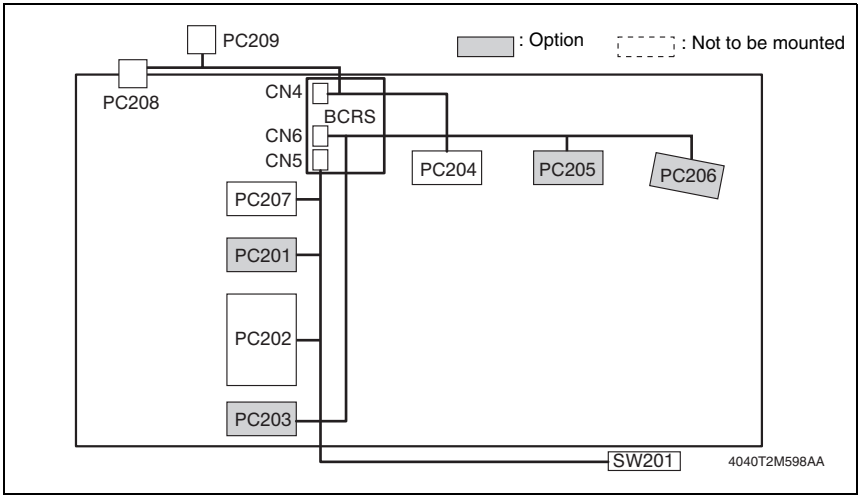
- The size of the original is determined through the combination of width and length detecting sensors turning ON or OFF.
- When the optional sensors are mounted, “Original Size Detecting Option” of “System Input” available from the Tech. Rep. mode should be set to “Yes.”
- The machine detects the original size when the Size Reset Switch is actuated with the Original Cover at an angle of 15° or less (sensor activated).
  The original size is validated when the Start key is pressed with the Original Cover at 15° or more.
- The original size is reset when the Size Reset Switch is deactuated.

for U.S and Canada area



Name		Connect to
PC202	Original Size Sensor 2	BCRS Board CN5
PC203 (Option)	Original Size Sensor3	BCRS Board CN6
PC204	Original Size Sensor4	BCRS Board CN4
PC205 (Option)	Original Size Sensor	BCRS Board CN6
PC206 (Option)	Original Size Sensor6	BCRS Board CN6
PC207 (Option)	Original Size Sensor7	BCRS Board CN5
PC208	Scanner Home Sensor	BCRS Board CN4
PC209	Original Cover Angle Sensor	BCRS Board CN4
SW201	Size Reset Switch	BCRS Board CN5

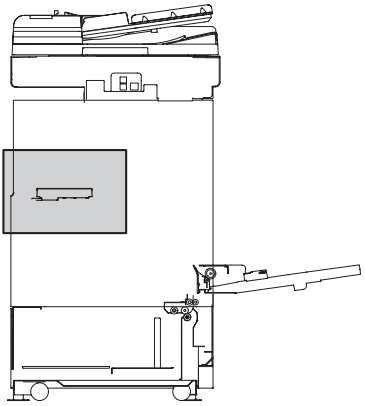
for Europe area



Name		Connect to
PC201 (Option)	Original Size Sensor 1	BCRS Board CN5
PC202	Original Size Sensor 2	BCRS Board CN5
PC203 (Option)	Original Size Sensor 3	BCRS Board CN6
PC204	Original Size Sensor 4	BCRS Board CN4
PC205 (Option)	Original Size Sensor 5	BCRS Board CN6
PC206 (Option)	Original Size Sensor 6	BCRS Board CN6
PC207	Original Size Sensor 7	BCRS Board CN5
PC208	Scanner Home Sensor	BCRS Board CN4
PC209	Original Cover Angle Sensor	BCRS Board CN4
SW201	Size Reset Switch	BCRS Board CN5

9. Write section (PH section)

9.1 Composition



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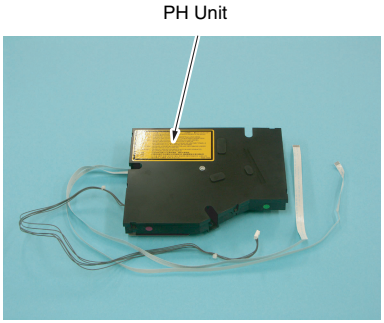

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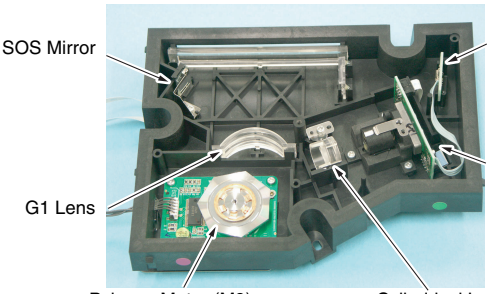

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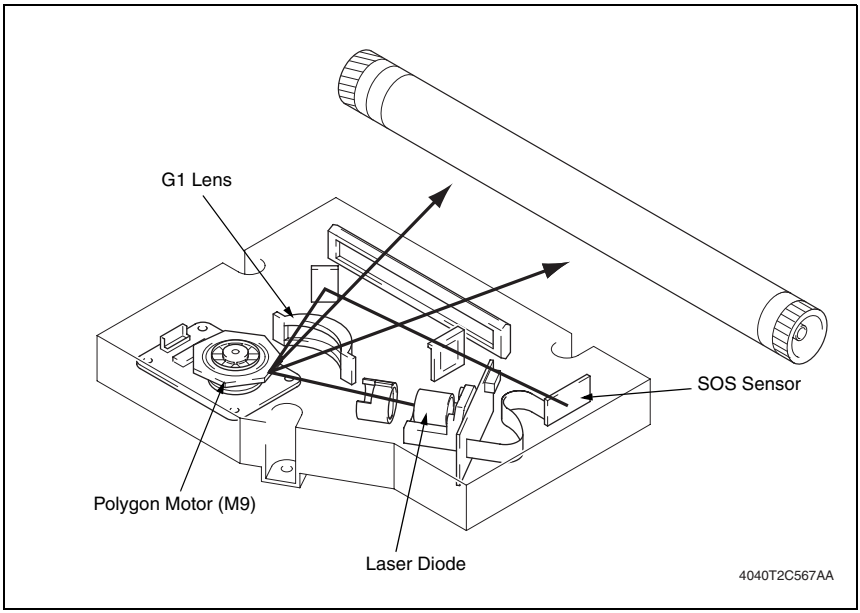
9.2 Operation

9.2.1 Laser exposure process

1. The laser light emitted from the semiconductor laser is reflected off the Polygon Mirror.
2. The Polygon Mirror has seven faces, being turned at high speeds by the Polygon Motor.
3. The light reflected off the Polygon Mirror illuminates the surface of the Photo Conductor via the G1 Lens.



9.2.2 Laser emission timing

- The laser light emitted from the Semiconductor Laser strikes the Polygon Mirror.
- When a Ready signal is detected after the lapse of a predetermined period of time after a print cycle has been started, the MFBS Board produces an output of a Laser ON signal.
- The Laser ON signal triggers the firing of each laser light which illuminates the SOS Board via the Polygon Mirror, G1 Lens, and SOS Mirror. This generates an SOS signal.
- The SOS Sensor ensures that the laser light emission start timing remains constant for each line of main scan.

9.2.3 Advance Polygon Rotation

- To shorten the first print time, the Polygon Motor is energized before a print command is issued.
- This timing starts when a original is loaded or a key on the control panel is pressed.
- If no print command is received during the advance energization, the motor is then deenergized.

9.2.4 Laser Shutter Mechanism

- A shutter is provided to prevent dust and dirt from entering the PH and a laser light, should it be inadvertently emitted, from leaking when the IU is removed from the machine.

4040T2C586AA

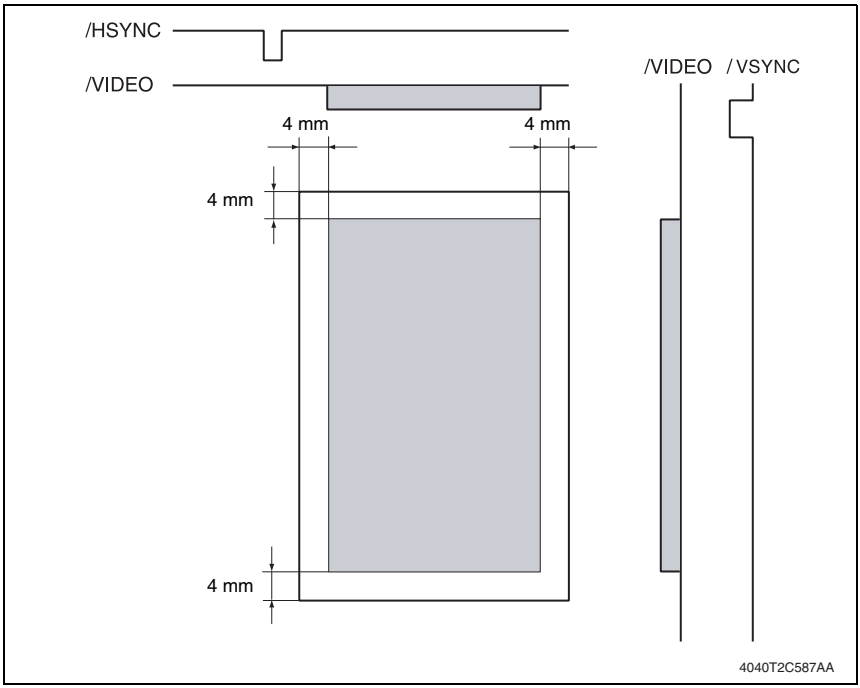
9.2.5 Laser emission area

A. Main scan direction

- The print start position in the FD direction is determined by the FD Print Start signal (HSYNC) that is output from the MFBS Board (MFBS) and the width of the paper.
- The laser emission area is determined by the paper size. The area of 4 mm on both edges of the paper is, however, the void image area.

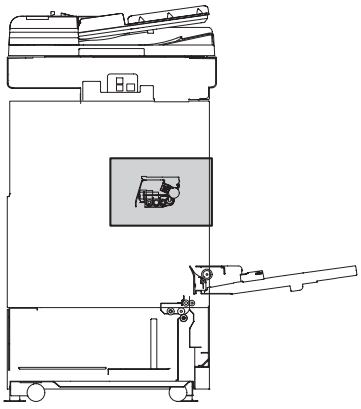
B. Sub scan direction

- The print start position in the CD direction is determined by the Image Write Start signal (VSYNC) that is output from the MFBS Board (MFBS) and the length of the paper.
- The laser emission area is determined by the paper size. The area of 4 mm on both edges of the paper is, however, the void image area.



10. Imaging Unit section (IU section)

10.1 Composition



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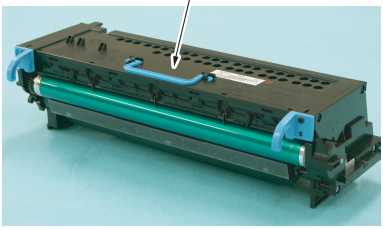
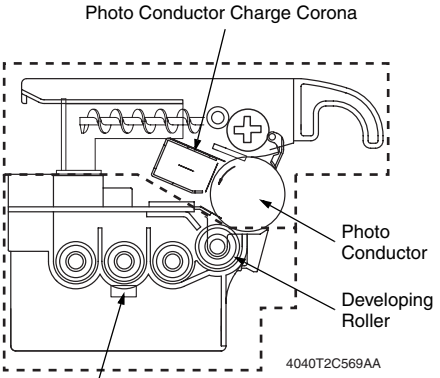


4040T2C501DA



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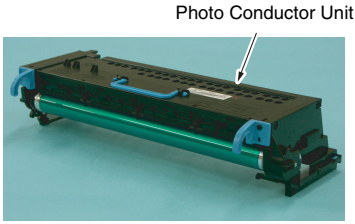
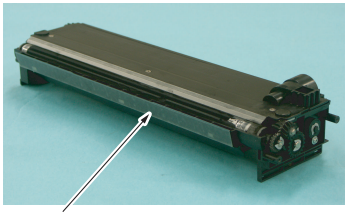
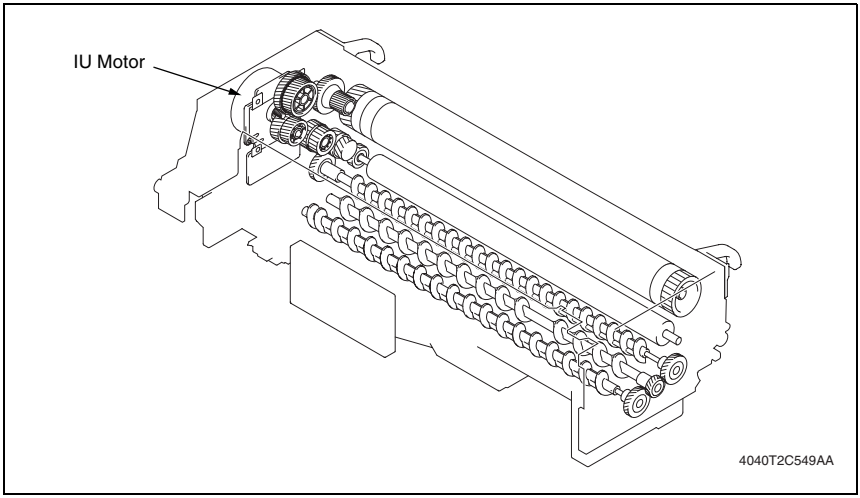




4040T2C521AA

10.2 Drive



10.3 Operation

10.3.1 Outline

- The IU section of this machine can be physically divided into the Photo Conductor Unit and Developing Unit. It is further divided into the charging, photo conductor, cleaning, and recycling sections.
- The Developing Unit is replaced once in four times of replacement of the Photo Conductor Unit and developer.

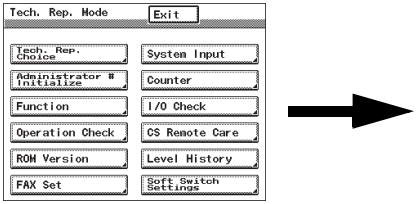
Photo Conductor Unit Life		Developing Unit Life
bizhub 350	100 K	400 K
bizhub 250	80 K	320 K
bizhub 200	65 K	260 K

- The Photo Conductor Unit and developer should be replaced at the same time.

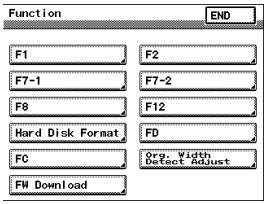
10.3.2 IU Life control

A. New IU detection

- The IU has no system of detecting a new unit. When the Photo Conductor Unit and developer have been replaced with new ones, the PC counter should be cleared.
  In addition, when the developer is replaced, be sure to run the F8 function of ATDC automatic adjustment.



4040T2E605AA



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B. When life is reached

- The following three counters available from the Tech. Rep. mode are used to detect the life of the Photo Conductor and IU.

(1) PC Life Counter

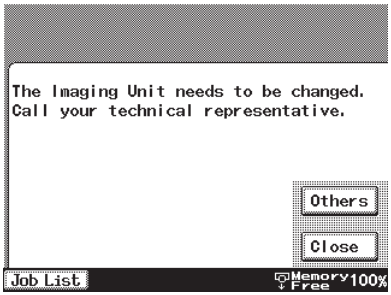
- Detects the period of time through which the Photo Conductor has been rotated as life.
- When the PC Life Counter reaches 100 %, a message that prompts the user to replace the Photo Conductor Unit will appear.

(2) I/C Life Counter

- Counts the number of printed pages produced according to the length of paper.

(3) Developer

- Counts the number of times the developer has been changed.
- Clearing the PC Life Counter increments the Developer counter by one.
- If the PC lifetime has been reached with the Developer counter reads 3 or more, the user is prompted to replace the IU with a new one by a message.



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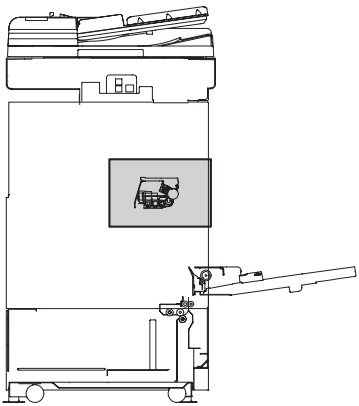
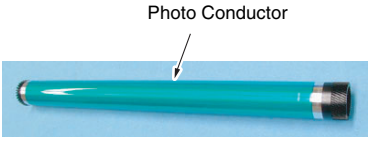
11. Photo Conductor section

11.1 Composition



4040T2C509AA



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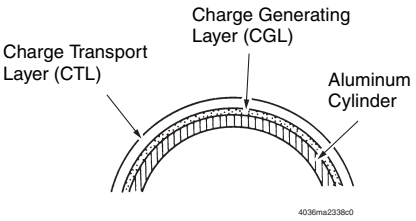
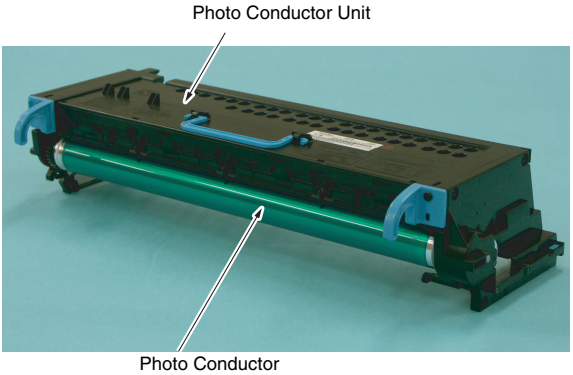
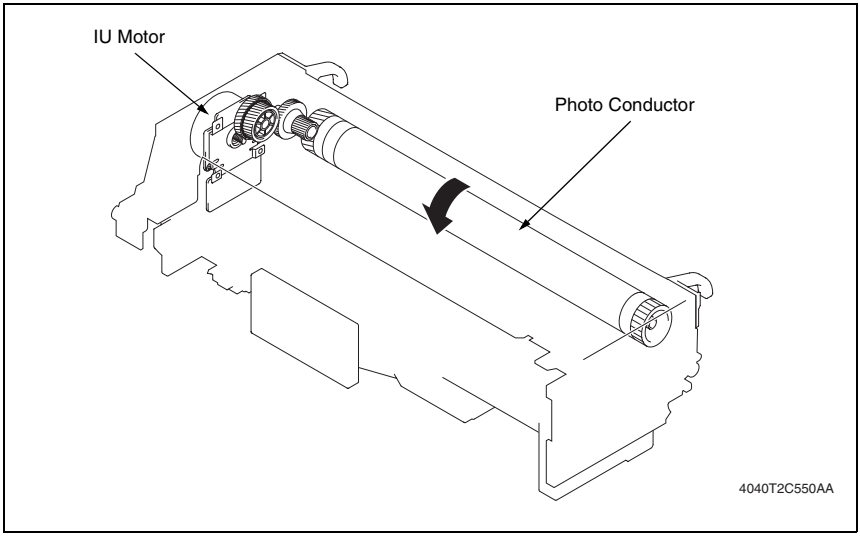


4036ma2338c0



4040T2C591AA

11.2 Drive

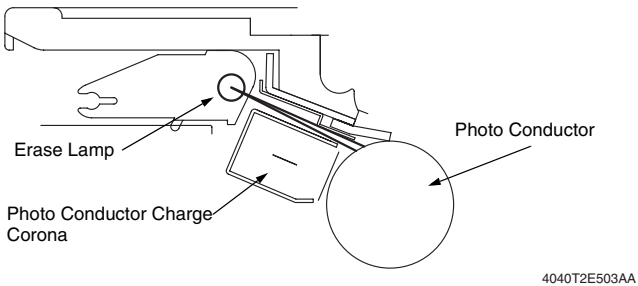


11.3 Operation

11.3.1 Photo Conductor cleaning mechanism

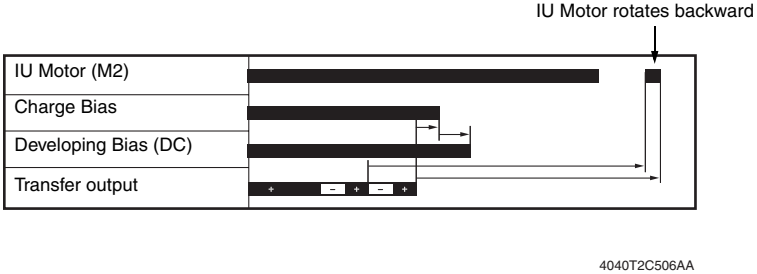
A. Main Erase operation

1. The Cleaning Blade is pressed up against the surface of the Photo Conductor, scraping residual toner off the surface.
2. The surface of the Photo Conductor after the image transfer process is irradiated with light from the Main Erase Lamp. This neutralizes any potential left on the surface of the Photo Conductor.



B. Photo Conductor backward rotation control

- To eliminate any areas on the surface of the Photo Conductor that are left uncleaned by the Cleaning Blade, the Photo Conductor is rotated backward at predetermined intervals.
- The IU Motor is energized to rotate backward each time the period of time through which the IU is run exceeds a predetermined value. Toner, paper dust, and other foreign matter collecting at the Cleaning Blade are recovered by the Toner Conveying Roller.

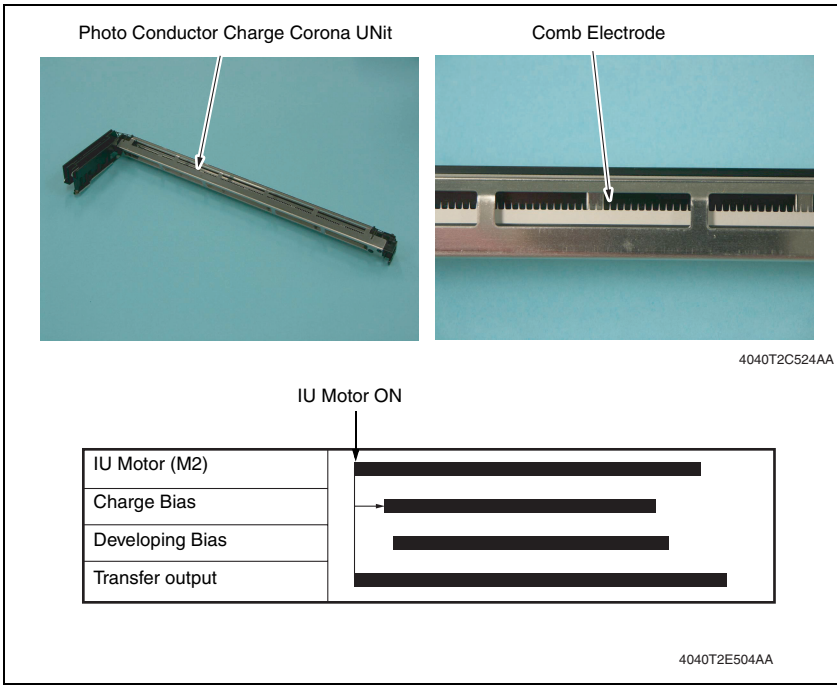


12. Charge Corona section

12.1 Operation

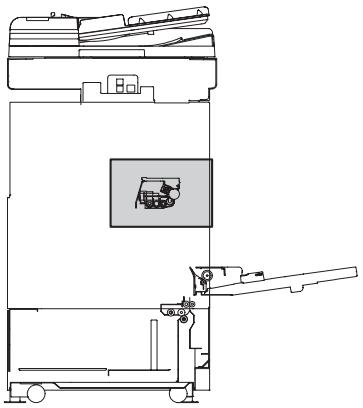
12.1.1 Charge Corona ON/OFF control

- The Comb Electrode deposits a charge evenly across the surface of the Photo Conductor through a grid mesh.
- The corona unit has a comb electrode that discharges only toward the grid mesh. This results in the amount of ozone produced being smaller than with the wire electrode.
- The grid voltage (Vg) applied to the Grid Mesh is controlled through the image stabilization control.



13. Developing section

13.1 Composition



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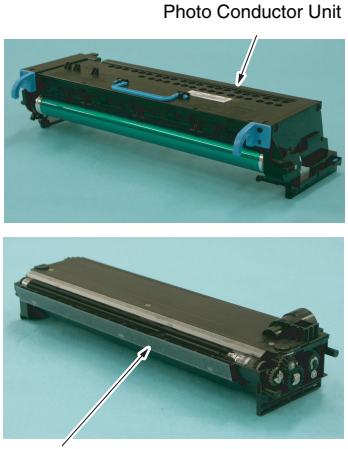

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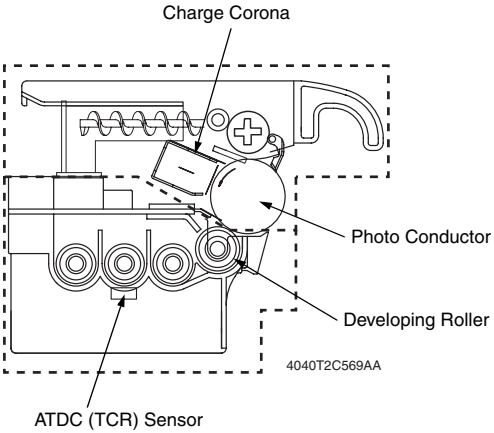
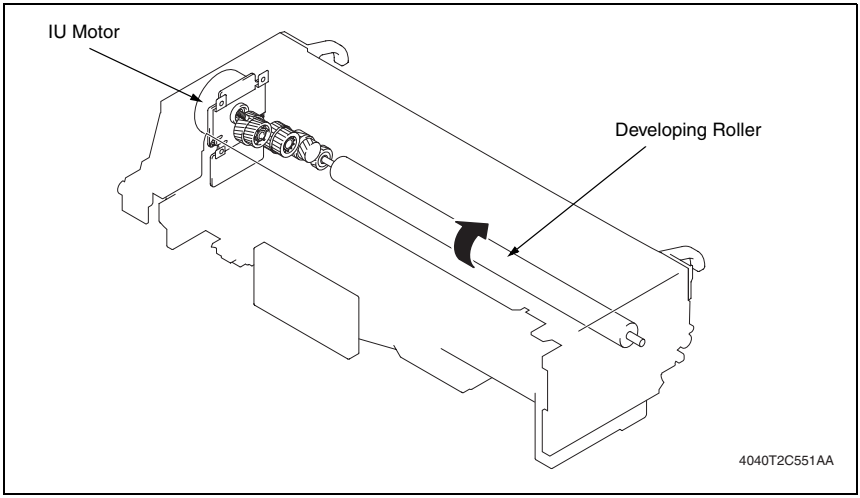


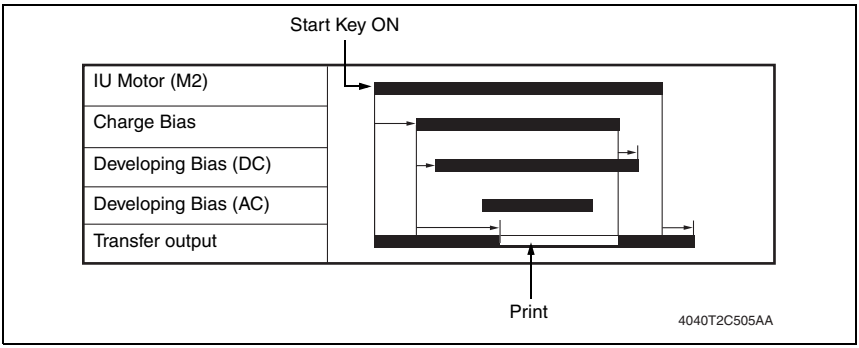
4040T2C569AA

13.2 Drive



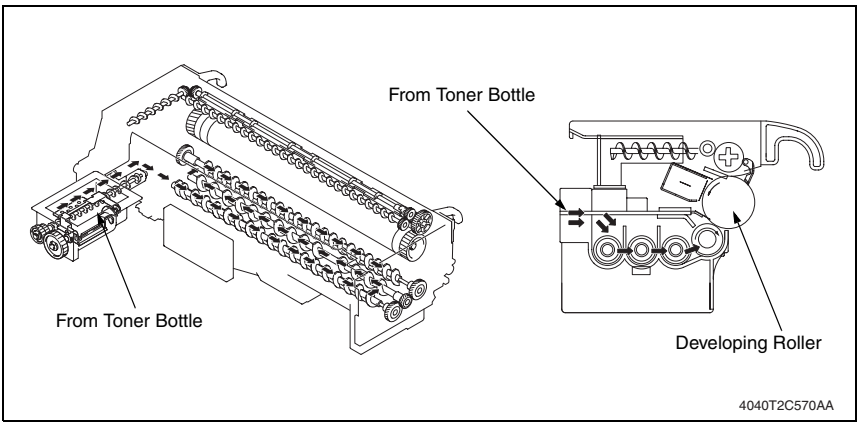
13.3 Operation

13.3.1 Developing Drive control



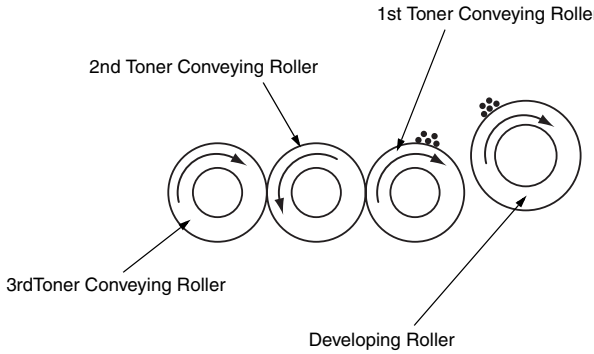
13.3.2 Developer flow

- Toner fed off from the Toner Bottle is agitated by the three rollers and conveyed onto the Developing Roller.



13.3.3 Developing Roller

- The Developing Roller consists of an outer sleeve roller and an inner magnet roller.
- The roller conveys developer to the point of development.
- The developer (carrier and toner) in the Developer Mixing Chamber is conveyed onto the point of development by the Toner Conveying Rollers and the Developing Roller.



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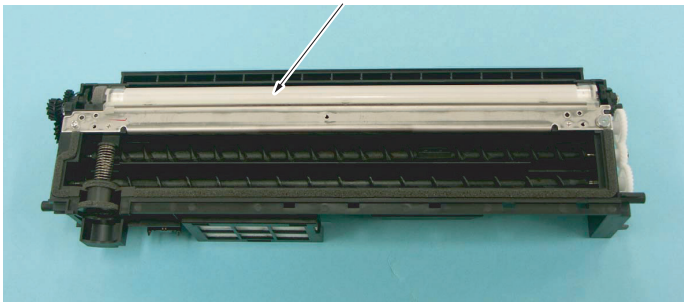

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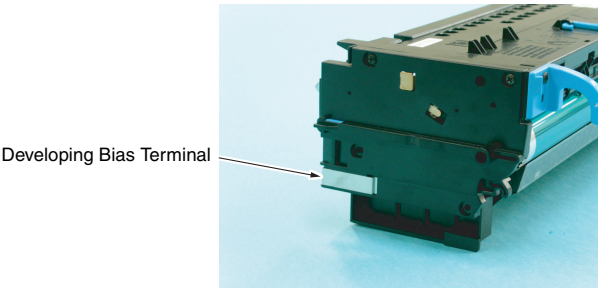
13.3.4 Developing bias

- The developing bias voltage (Vdc) is applied to the Developing Roller so that an adequate amount of toner is attracted onto the surface of the Photo Conductor.
- In addition to the negative DC component, AC voltage is applied during development to help toner to be attracted more easily to the surface of the Photo Conductor.



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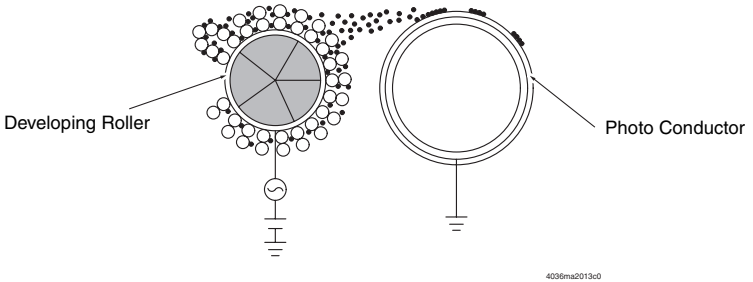
13.3.5 HMT (High grade Micro Toning) development

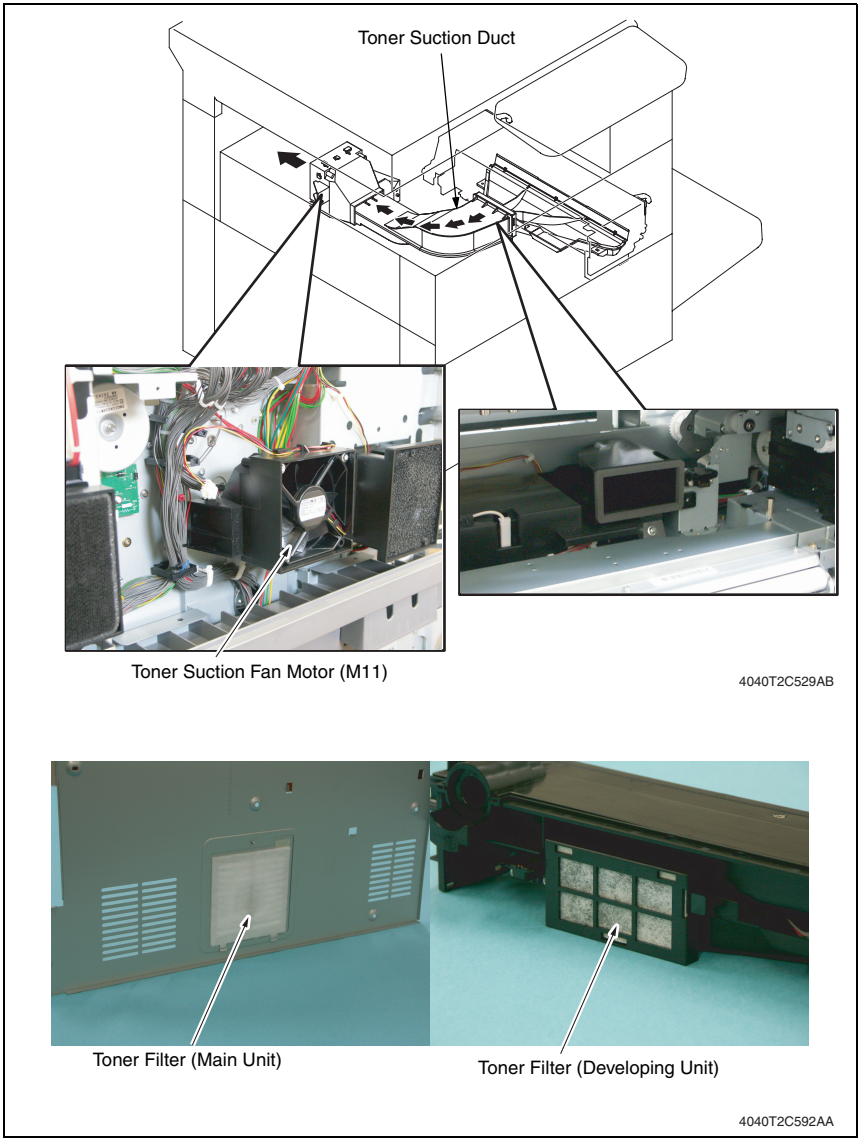
- With the HMT method, the magnetic developer brush does not rub against the surface of the Photo Conductor (the images). Accordingly, sharper line images can be reproduced, involving no uneven image density at the trailing edge or thin lines and achieving even finer reproduction of the solid image areas.



4036ma2013c0

13.3.6 Developer Scattering Preventive Mechanism

- To prevent the image and machine interior from being dirtied, the Toner Suction Fan Motor draws air so that toner particles rising up in the Developing Unit can be trapped.
- A Suction Duct is provided for the IU (Developing Unit). As air is drawn by the Toner Suction Fan Motor, toner particles rising up during development are removed from the air that passes through the Suction Duct.
- The Toner Suction Fan Motor rotates when the IU Motor is energized.
- The Toner Filter on the Developing Unit side and that on the machine side trap toner particles from the air drawn by the Toner Suction Fan Motor.

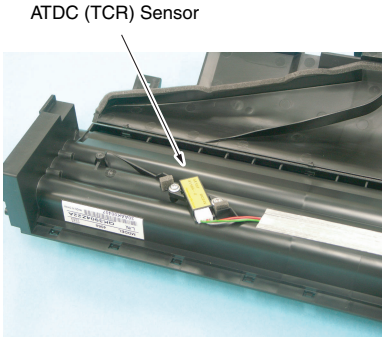


13.3.7 ATDC (TCR) Sensor control

- The ATDC (TCR) Sensor is located on the underside of the Developing Unit. The sensor is a magnetic type that detects the toner-to-carrier ratio (T/C).
- Adjustment of the ATDC (TCR) Sensor is made only when the developer is changed.

A. Magnetic ATDC (TCR) Sensor

- The magnetic permeability (powder density) of the carrier in the developer is measured to determine the T/C.
- A mylar is provided for the Conveying Screw portion to scrape toner off the surface of the ATDC (TCR) Sensor.
- Since the ATDC (TCR) Sensor is located on the underside of the Developing Unit, it is replaced after the developer has been dumped.



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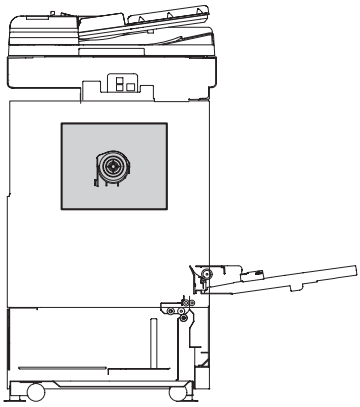
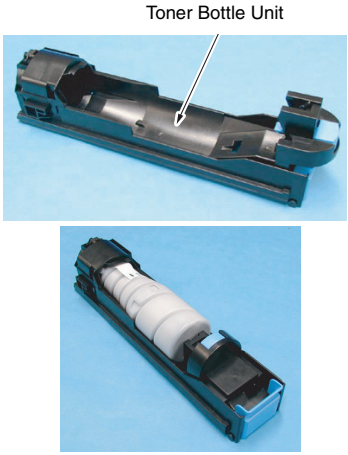
14. Toner Supply section

14.1 Composition



4040T2C510AA



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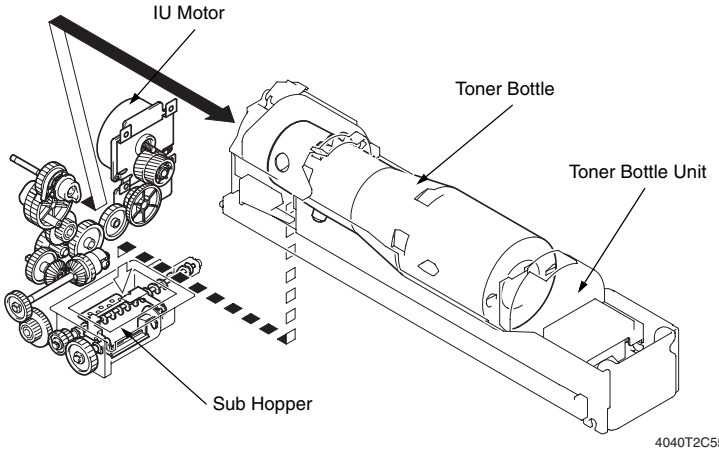
14.2 Drive



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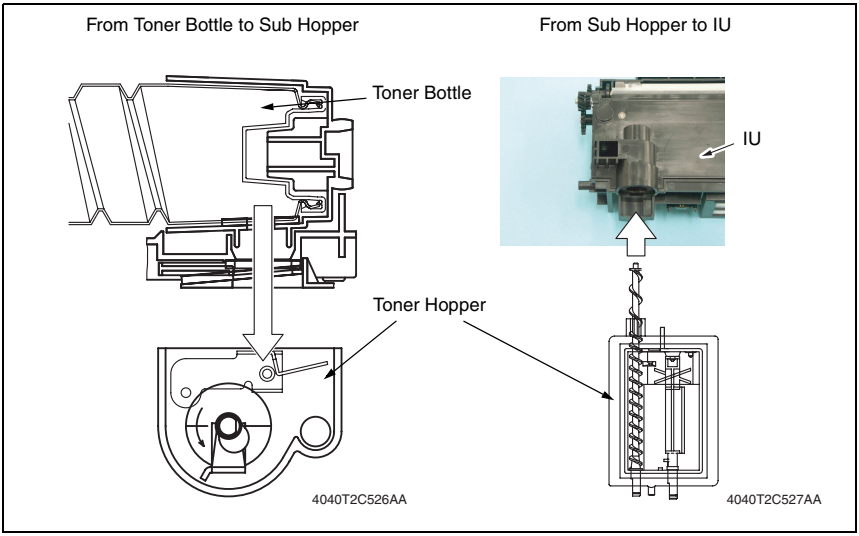
14.3 Operation

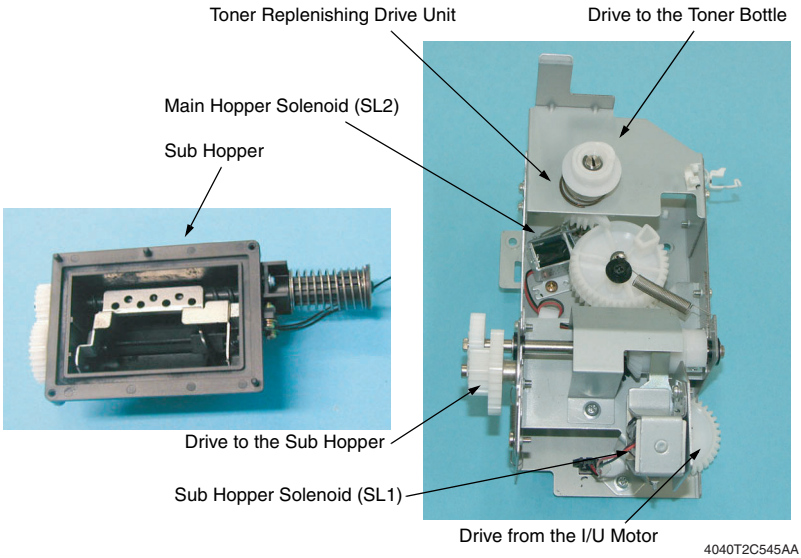
14.3.1 Toner Replenishing/control

- Toner is supplied from the Toner Bottle to Sub Hopper and from the Sub Hopper to Developing Unit according to the T/C ratio detected by the ATDC (TCR) Sensor.



A. Toner replenishing mechanism

- The I/U Motor provides the drive for replenishing toner from the Toner Bottle to the Sub Hopper and to the Developing Unit.
- The Main Hopper Toner Solenoid and Sub Hopper Toner Solenoid function to control transmission of the drive.
- The Toner Bottle is rotated when the Main Hopper Solenoid is energized.
- Drive is transmitted to the Sub Hopper when the Sub Hopper Solenoid is energized.

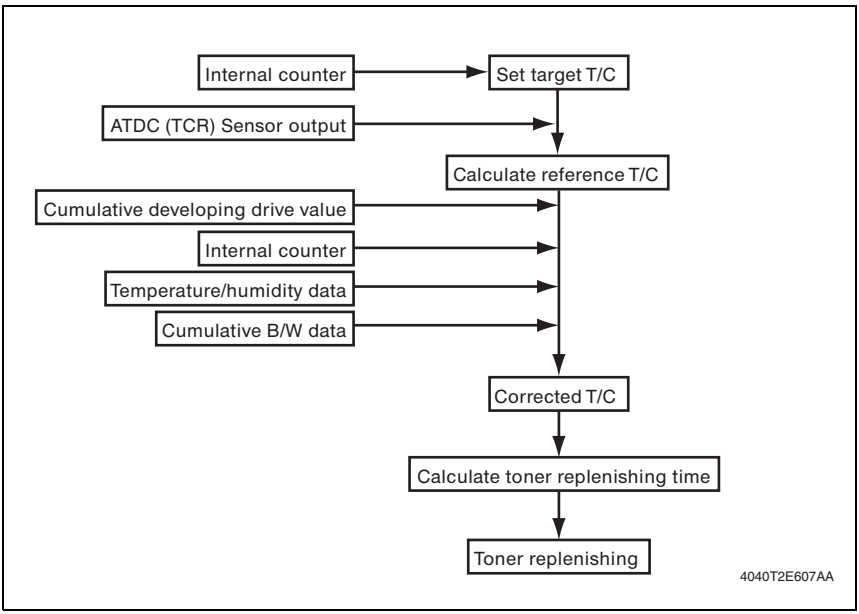


B. Toner replenishing operation

- Toner replenishing operation is performed through two different control modes: toner replenishing amount setting control and toner replenishing control.

(1) Toner replenishing amount setting control

1. The target T/C ratio is set based on the reading of an internal counter (estimated number of printed pages produced) at the time when the I/U Motor is started.
2. While the IU Motor is rotating, the T/C ratio in the Developing Unit is measured by the ATDC (TCR) Sensor and the reference T/C value is calculated (reference T/C).
3. Correction values that represent actual environmental conditions, cumulative developing drive duty ratio, and related values are then incorporated in the reference T/C to calculate a corrected T/C value (corrected T/C).
4. The toner replenishing time (amount) is established from the target T/C ratio and the corrected T/C ratio.



<Target T/C setting table>

Estimated number of output pages (K printed pages)	Target T/C (%)
0 to 4	7.00
5 to 9	6.50
10 to 14	6.00
15 to 19	5.50
20 or more	5.00
⋮	⋮

(2) Toner replenishing control

- The Sub Hopper Solenoid is energized and kept so for the period of the toner replenishing time (amount) established through the toner replenishing amount control.
  The Sub Hopper is thus energized to replenish the supply of toner to the Developing Unit.
- As toner level in the Sub Hopper becomes low, the Sub Hopper Solenoid is energized so that toner may be supplied to the Sub Hopper.
- The corrected T/C is compared with the target T/C to determine if T/C is more or less than a predetermined value. If either is detected, a faulty ATDC (TCR) Sensor results and a Tech. Rep. call display is given.

T/C Value	Replenishing Time/Cycle
Corrected T/C ≤ Target T/C -2.5 %	Faulty ATDC (TCR) Sensor
Target T/C -2.5 % ≤ Corrected T/C < Target T/C -1.5 %	To T/C recovery mode
Target T/C -1.5 % ≤ Corrected T/C < Target T/C -0.75 %	Full replenishing
Target T/C -0.75 % ≤ Corrected T/C < Target T/C -0.25 %	1/2 replenishing
Target T/C -0.25 % ≤ Corrected T/C < Target T/C	1/4 replenishing
Target T/C ≤ Corrected T/C < Target T/C +2.5 %	Not replenished
Target T/C +2.5 % ≤ Corrected T/C	Faulty ATDC (TCR) Sensor

C. T/C recovery mode

- A T/C recovery sequence is performed if the T/C ratio detected through toner density detection is extremely low.
- When the machine is set into the T/C recovery mode, the IU Motor is energized to perform the toner replenishing sequence until the correct T/C is recovered.

(1) Operation timing

- A predetermined T/C ratio is detected in toner replenishing control.
- A T/C ratio more or less than the predetermined value is detected with neither a toner near-empty nor toner empty display given.
- The T/C recovery conditions corresponding to each operating mode are met.

<Determination of T/C recovery in different operating modes>

Toner condition	T/C	Front Door open/close	Power ON	Right Door open/close	During copy cycle
Toner empty condition	Corrected T/C ≤ Target T/C	❍	❍	-	-
	Target T/C ≥ Corrected T/C	-	-	-	-
Toner near-empty condition	(Target T/C -2.5) ≥ (Corrected T/C) ≤ (Target T/C -1.5 %)	❍	❍	❍	❍
	(Target T/C -1.5) ≥ (Corrected T/C) ≤ (Target T/C -1.0 %)	❍	❍	-	-
	(Target T/C -1.0 %) ≤ (Corrected T/C)	-	-	-	-
Normal condition	(Target T/C -2.5) ≥ (Corrected T/C) ≤ (Target T/C -1.5 %)	-	❍	❍	❍
	(Target T/C -1.5 %) ≤ (Corrected T/C)	-	-	-	-

❍: T/C recovery sequence is performed
-: T/C recovery sequence is not performed

(2) T/C recovery mode terminating conditions

- The predetermined T/C is reached.
- After the lapse of a predetermined period of time after the T/C recovery sequence has been started.

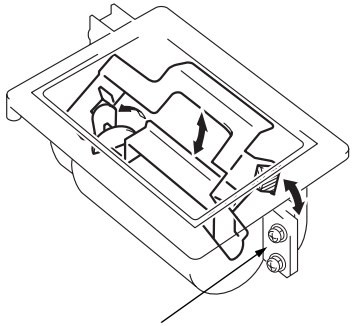
Recovery and termination timing	Details
Proceeding to T/C recovery	Less than (Target T/C -1.5) %
T/C at toner near-empty condition	Less than (Target T/C -1) %
Determining if T/C recovery is completed	Target T/C or more
T/C recovery in progress (T/C recovery sequence start → toner empty → mixing completed)	bizhub 350: 210 sec bizhub 200 / 250: 240 sec
T/C recovery sequence start → Toner empty detection	bizhub 350: 150 sec bizhub 200 / 250: 171.4 sec
Mixing time following completion of T/C recovery sequence	bizhub 350: 60 sec bizhub 200 / 250: 68.6 sec

14.3.2 Toner Near-Empty and Toner Empty detection control

- The Sub Hopper Empty Switch provided in the Sub Hopper detects a toner empty condition.
- A toner near empty condition is detected when the Toner Bottle is rotated 30 complete turns continuously. The number of times that the Main Hopper Solenoid is energized is counted to provide the basis for the toner near empty condition.

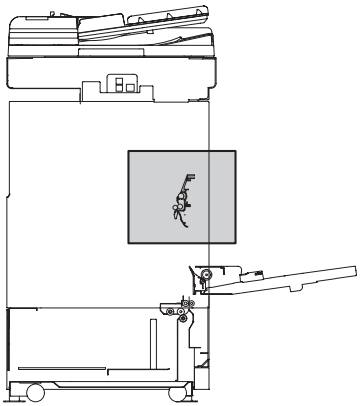
A. Replenishing operation

1. As the level of toner in the Sub Hopper becomes low, the magnet portion lowers and the Sub Hopper Empty Switch (S4) is eventually actuated.
2. When a toner empty condition is detected, the Main Hopper Solenoid (SL2) is energized to let the Toner Bottle start rotating. When the Main Hopper Solenoid (SL2) is deenergized, it brings the Toner Bottle to a stop.



15. Transfer Corona section

15.1 Composition



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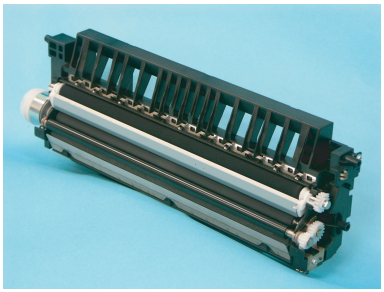
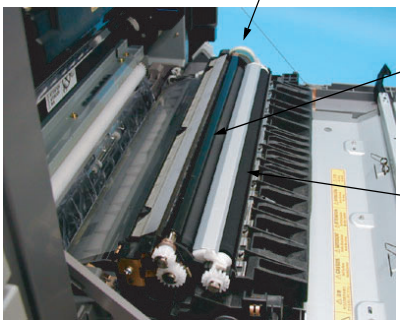
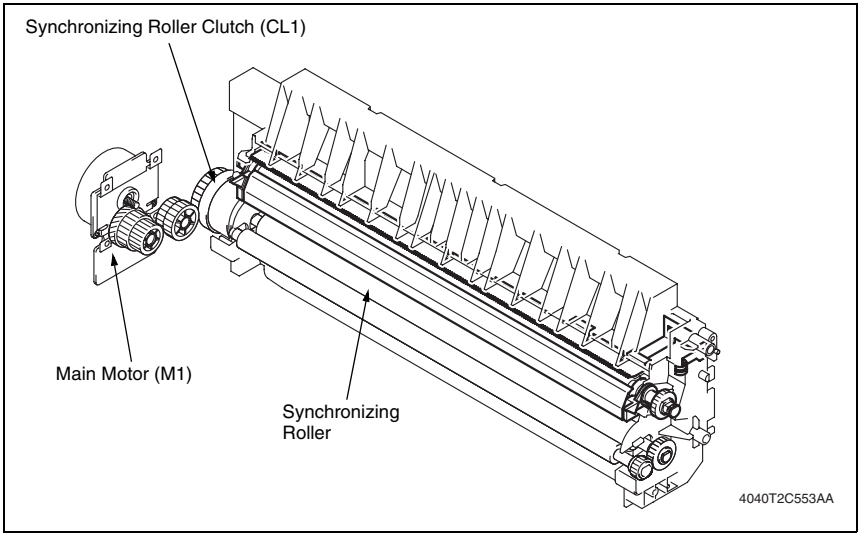


4040T2C530AA



4040T2C505DA

15.2 Drive



15.3 Operation

15.3.1 Transfer Mechanism

- A charge is applied to the Image Transfer Roller to transfer the toner image formed on the surface of the Photo Conductor onto the paper.
- The image transfer current is controlled according to the size and type of paper, B/W ratio of the original, and whether the copy cycle is 1-sided or 2-sided.

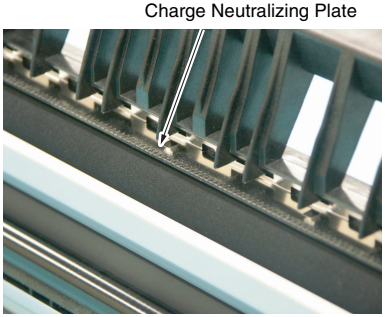
15.3.2 Transfer Roller Cleaning

- To remove any toner left on the surface of the Transfer Roller, a charge of the same polarity (minus) as the toner is applied to the Transfer Roller. The Transfer Roller is thereby cleaned of residual toner.
- The Transfer Roller cleaning sequence is carried out when the Front Door or Right Door is opened and closed.

15.3.3 Charge neutralization and separation of paper

A. Charge Neutralizing Plate

- To neutralize any charge potential left in the paper which has undergone the image transfer stage, there is the Charge Neutralizing Plate fitted to the guide plate after the Transfer Roller.
- The output of the Charge Neutralizing Plate is automatically selected according to the type of paper used or whether the current print cycle is for the first side or second side.



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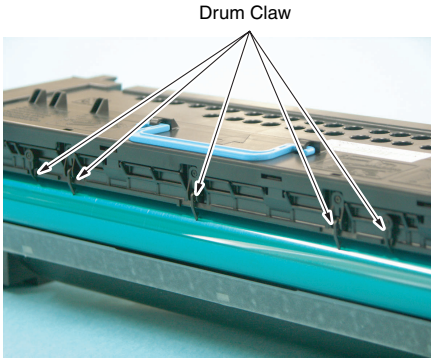
B. Drum Separation Claw

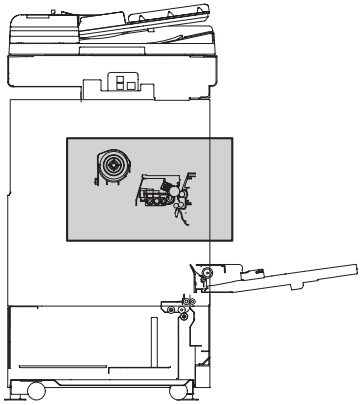
- The Drum Separation Claws mounted in the IU properly separate paper from the surface of the Photo Conductor.



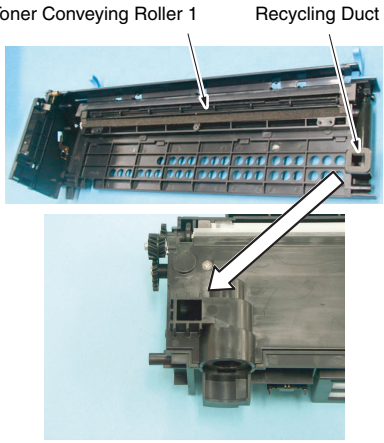
4040T2C532AA

16. Toner Collecting section

16.1 Composition

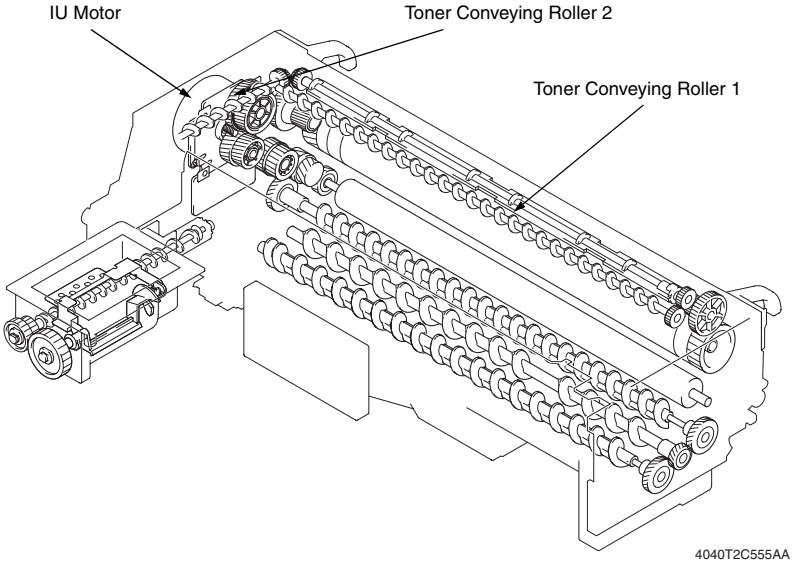


4040T2C512AA



4040T2C556AA

16.2 Drive

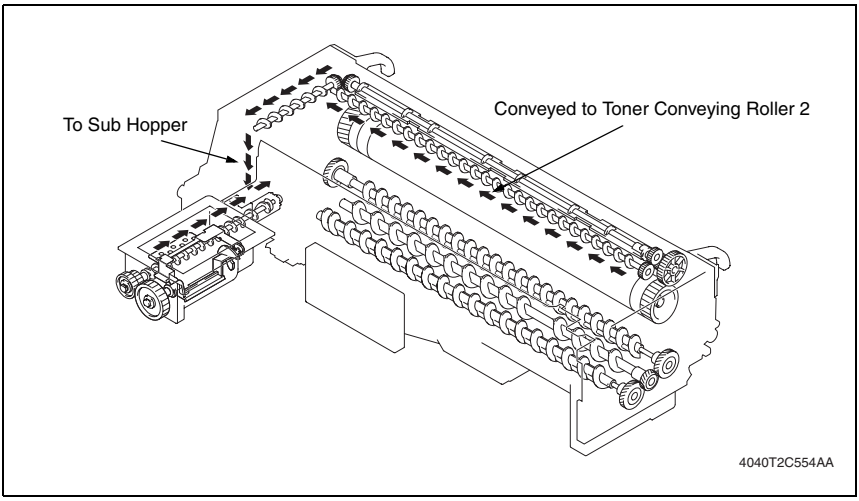


4040T2C555AA

16.3 Operation

16.3.1 Toner recycling mechanism

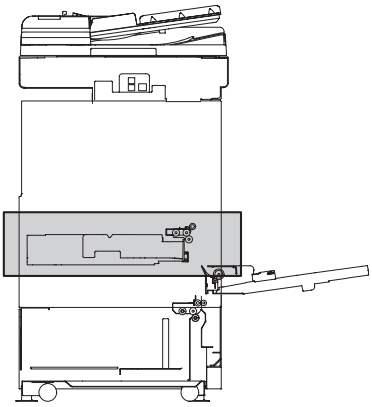
- The Cleaning Blade pressed up against the surface of the Photo Conductor scrapes residual toner off the surface. The toner is then conveyed by the Toner Conveying Rollers 1/2 to the Recycling Duct and eventually back to the Developer Mixing Chamber.
- Since the toner is thus recovered back to the Developer Mixing Chamber, there is no Waste Toner Bottle mounted in the machine.



17. Paper feed section

17.1 Composition

17.1.1 Tray1



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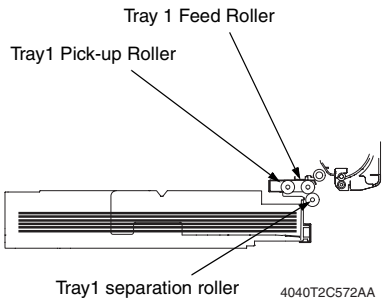
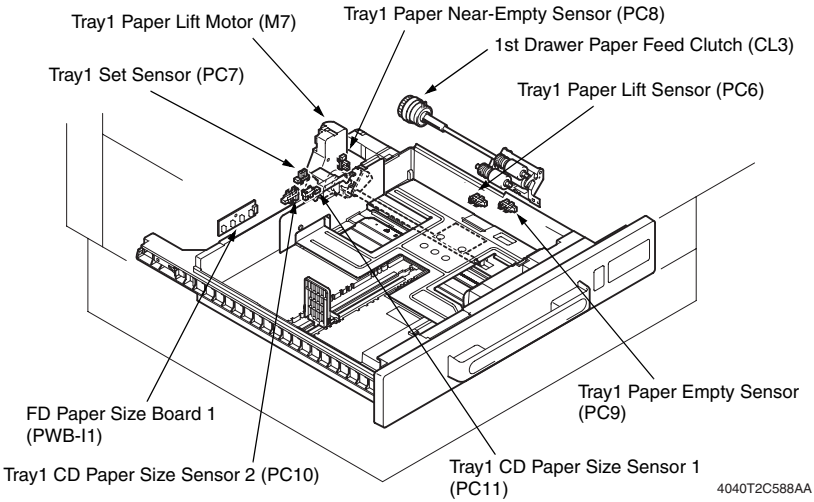
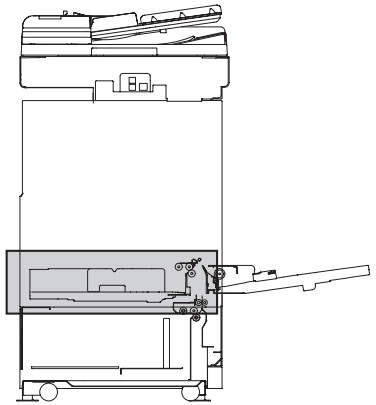


4040T2C572AA

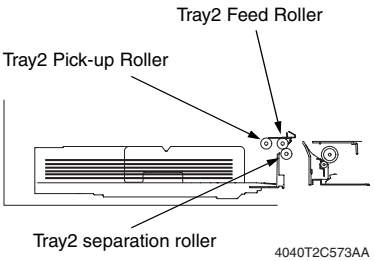

Tray1 Paper Lift Motor (M7)
Tray1 Paper Near-Empty Sensor (PC8)
1st Drawer Paper Feed Clutch (CL3)
Tray1 Set Sensor (PC7)
Tray1 Paper Lift Sensor (PC6)
Tray1 Paper Empty Sensor (PC9)
FD Paper Size Board 1 (PWB-I1)
Tray1 CD Paper Size Sensor 2 (PC10)
Tray1 CD Paper Size Sensor 1 (PC11)

4040T2C588AA

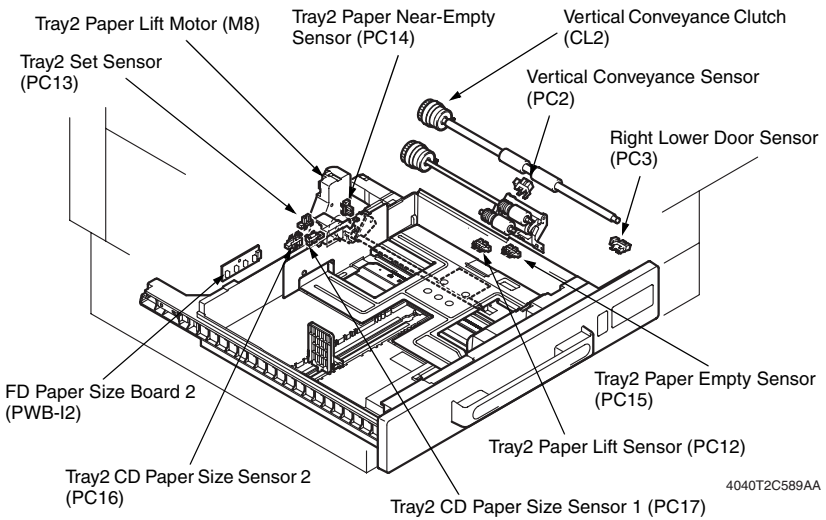
17.1.2 Tray2



4040T2C514AA



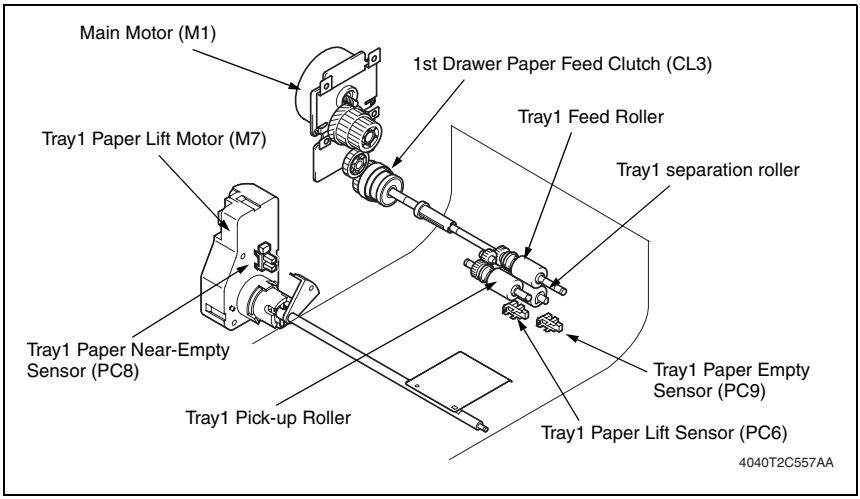
4040T2C573AA


Tray2 Paper Lift Motor (M8)
Tray2 Paper Near-Empty Sensor (PC14)
Vertical Conveyance Clutch (CL2)
Tray2 Set Sensor (PC13)
Vertical Conveyance Sensor (PC2)
Right Lower Door Sensor (PC3)
FD Paper Size Board 2 (PWB-I2)
Tray2 Paper Empty Sensor (PC15)
Tray2 Paper Lift Sensor (PC12)
Tray2 CD Paper Size Sensor 2 (PC16)
Tray2 CD Paper Size Sensor 1 (PC17)

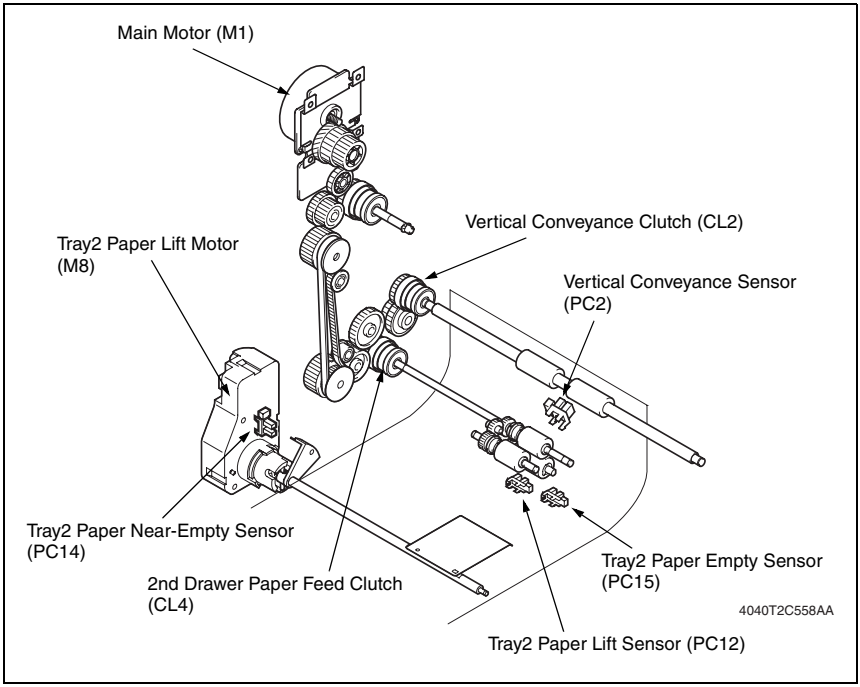
4040T2C589AA

17.2 Drive

17.2.1 Tray1

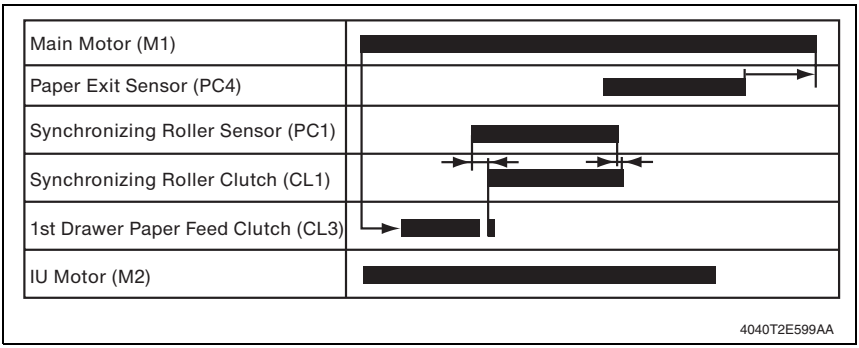


17.2.2 Tray2

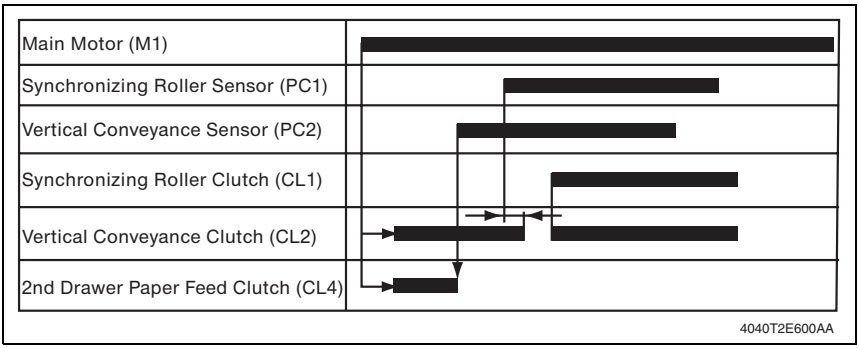

Main Motor (M1)
Vertical Conveyance Clutch (CL2)
Tray2 Paper Lift Motor (M8)
Vertical Conveyance Sensor (PC2)
Tray2 Paper Near-Empty Sensor (PC14)
Tray2 Paper Empty Sensor (PC15)
2nd Drawer Paper Feed Clutch (CL4)
4040T2C558AA
Tray2 Paper Lift Sensor (PC12)

17.3 Operation

17.3.1 Paper Feed control (Tray1)

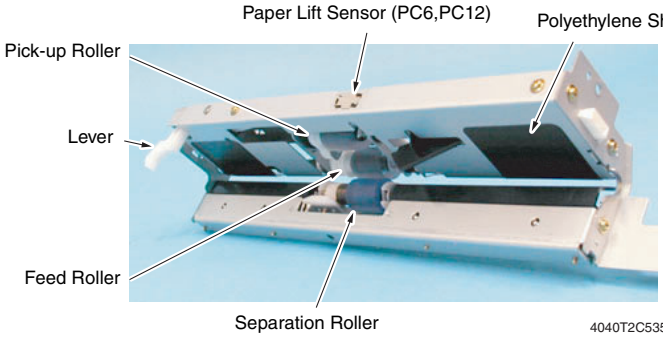


17.3.2 Paper Feed control (Tray2)

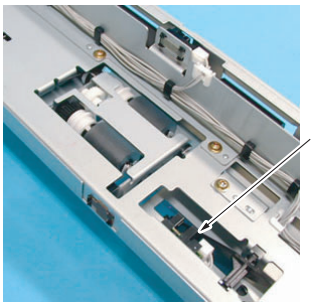


17.3.3 Paper Feed Mechanism

- The Paper Feed Motor drives the Pick-up Roller and Paper Take-up Roller to take up and feed a sheet of paper into the main unit.
- The Pick-up Roller takes up sheets of paper and the Paper Feed and Separation Rollers ensure that only one sheet of paper is separated and fed into the main unit.
- When the drawer is slid in, the lever is pushed to lower the Pick-up Roller.
- The Lift-up Upper Limit Sensor then detects the upper limit position when the paper lifting plate is raised.
- The Paper Empty Sensor detects when paper in the drawer runs out.



4040T2C535AA



4040T2C536AA

Pick-up Roller Home Position

Pick-up Roller Feed Position

4040T2C537AA

17.3.4 Paper Near-Empty/Paper Empty detection

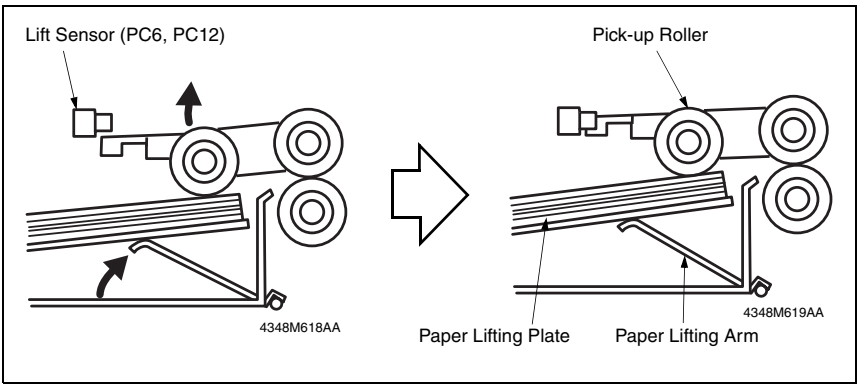
- When the Paper Empty Sensor is blocked/unblocked, a corresponding warning display is given on the control panel.

17.3.5 Tray ascent operation

- When the drawer is slid into the main unit and the Set Sensor is activated, the Lift Motor starts rotating to raise the Paper Lifting Plate.
- The paper stack of the drawer pushes up the Pick-up Roller. When the upper limit position is detected through the action of the actuator, it stops raising the paper lifting plate.
- As paper is consumed during the print cycle and the Pick-up Roller is lowered, the Lift Motor is energized until the Lift Sensor is blocked again.

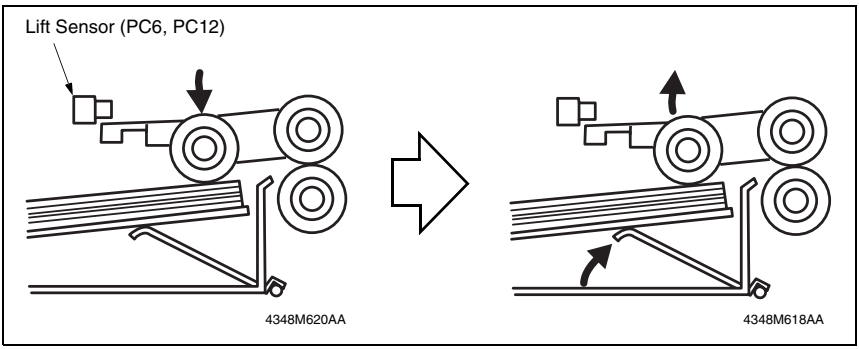
A. Operation overview (when Tray is slid in)

1. The paper lifting plate goes up and the top surface of the paper stack pushes up the roller.
2. The lifting motion stops as soon as the sensor detects the upper limit position.



B. Operation overview (during a copy cycle)

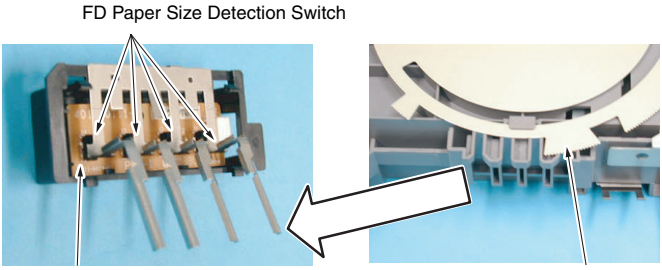
1. As the paper is consumed, the sensor is unblocked.
2. The paper lifting plate goes up.



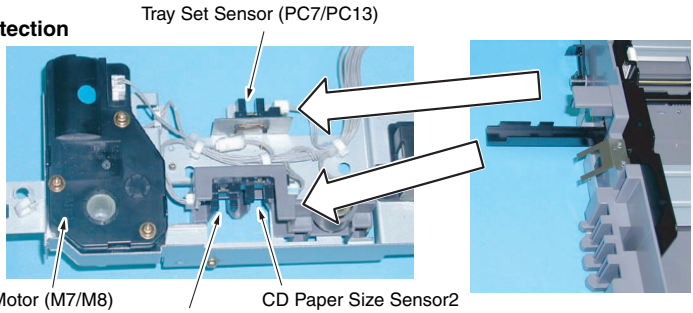
17.3.6 Paper size detection

- When the Trailing Edge Stop of the drawer is moved, the circular plate located on the bottom of the drawer turns, allowing the four switches to detect the paper length.
- Moving the Edge Guide activates or deactivates the two CD Paper Size Sensors through the cutout in the lever.
- The combination of the four FD Paper Size Detecting Switches that are either actuated or deactuated and two CD Paper Size Sensors that are either activated or deactivated determines the size of the paper loaded in the drawer.

Length Detection



Width Detection



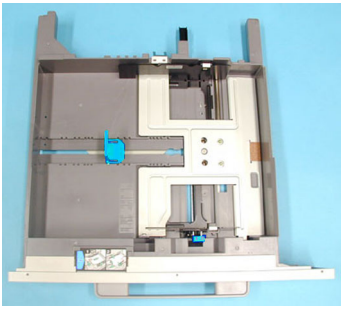
4040T2C538AA

17.3.7 ON/OFF positions of Paper Size Detecting Switches/Sensors and Corresponding Paper Size Detected

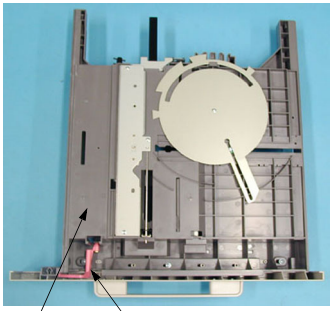
	FD Paper Size Board 1 (PWB-I1) FD Paper Size Board 2 (PWB-I2)				Tray1 CD Paper Size Sensor1	Tray1 CD Paper Size Sensor2
Paper Size	SW1	SW2	SW3	SW4		
B5	ON	ON	OFF	OFF	ON	OFF
A5R	ON/OFF	OFF	OFF	OFF	OFF	OFF
A4	ON/OFF	OFF	OFF	OFF	ON	OFF
Letter	OFF	OFF	OFF	OFF	OFF	OFF
LetterR	ON	OFF	OFF	ON	OFF	ON
B5R	OFF	OFF	ON	OFF	OFF	OFF
A4R	OFF	ON/OFF	ON	ON	OFF	ON
11 × 14	ON	ON	ON	OFF	ON	ON
B4	ON	ON	ON	OFF	ON	OFF
A3	ON	ON/OFF	ON	ON	ON	OFF

17.3.8 Paper level indicator mechanism

- There is a window in the front cover of the drawer for indicating the paper supply level.
- When the Paper Lifting Plate goes up, a red lever appears in the window. The lower the level of the paper stack, the more the red portion is visible.



4348M608AA

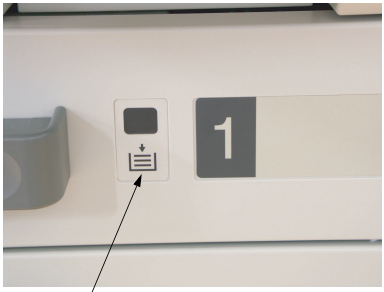


4348M609AA

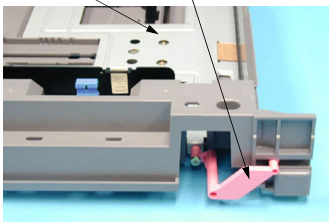
Drawer Bottom Plate

Paper Lifting Plate

Lever



4040T2C593AA



4348M611AA

Paper Level Indicator on the front cover of the drawer

Operated by the paper lifting plate of the drawer

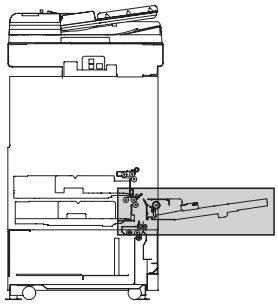
17.3.9 Paper feed retry control

- To minimize the occurrence of a paper misfeed, the paper feed sequence is temporarily halted if the paper fails to reach the Synchronizing Roller Sensor within a predetermined period of time after the sequence has been started.
- This paper feed retry sequence is performed with Tray2 and Multi Bypass Tray if the paper fails to reach the Vertical Conveyance Sensor within a predetermined period of time after the sequence has been started.
- These paper feed sequences are repeated a given number of times. If the paper still fails to reach the Synchronizing Roller Sensor after the specified number of paper feed sequences, a paper misfeed condition results.

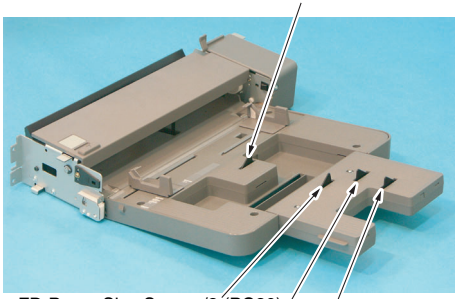
	No. of Paper Feed Retry Sequences
Paper Feed Retry	2

18. Bypass section

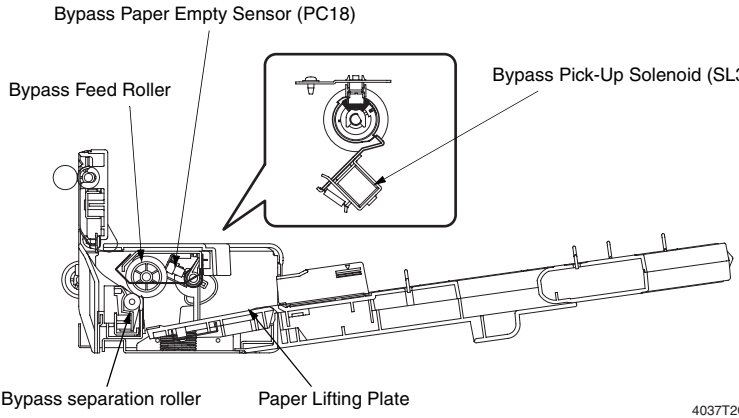
18.1 Composition



4040T2C515AA

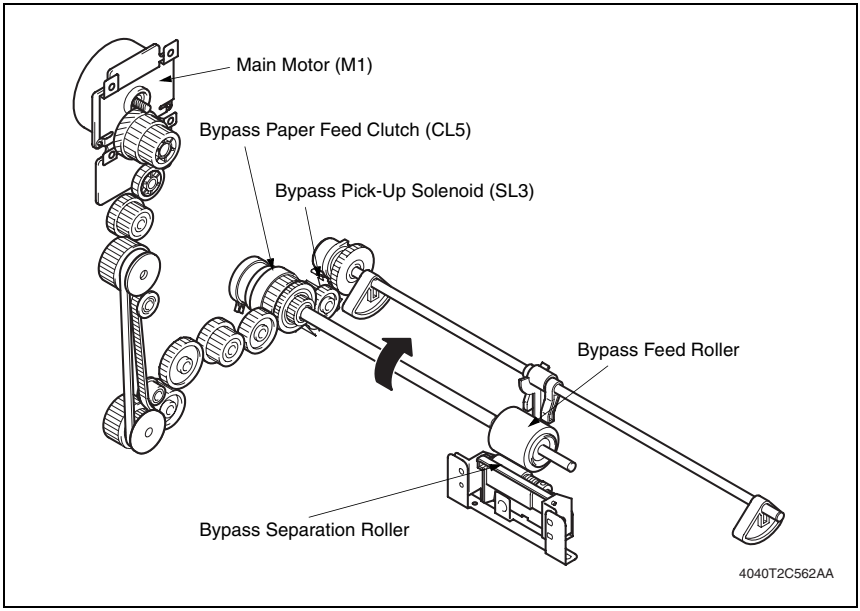

Bypass FD Paper Size Sensor/1 (PC19)
Bypass FD Paper Size Sensor/2 (PC20)
Bypass FD Paper Size Sensor/3 (PC21)
Bypass FD Paper Size Sensor/4 (PC22)

4037T2C535AA



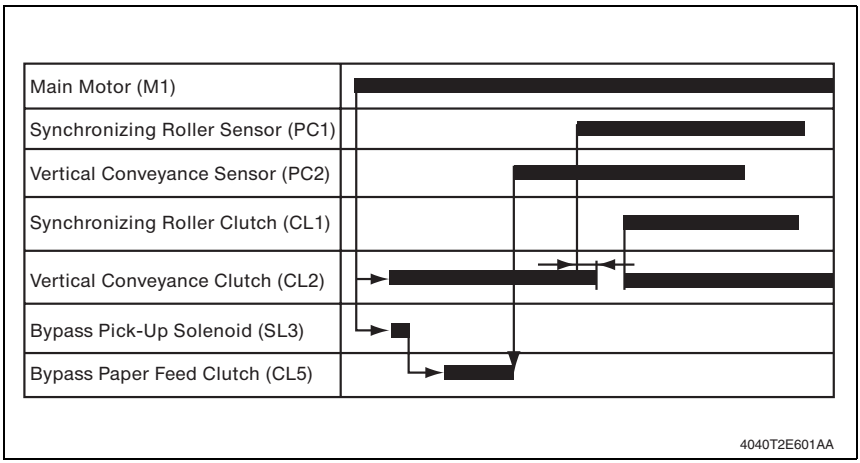
4037T2C536AA

18.2 Drive



18.3 Operation

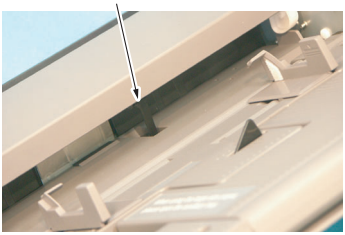
18.3.1 Bypass Paper Feed control



18.3.2 Paper Empty detection

- The Bypass Paper Empty Sensor detects a paper empty condition in the Bypass Section.

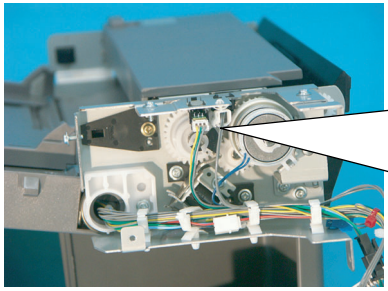
Bypass Paper Empty Sensor (PC18)

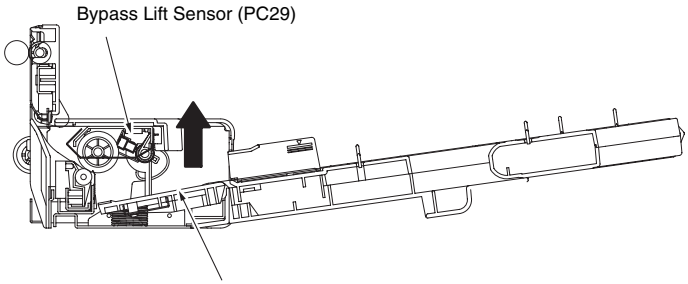


4036ma2530c0

18.3.3 Bypass Paper Lifting Motion Control

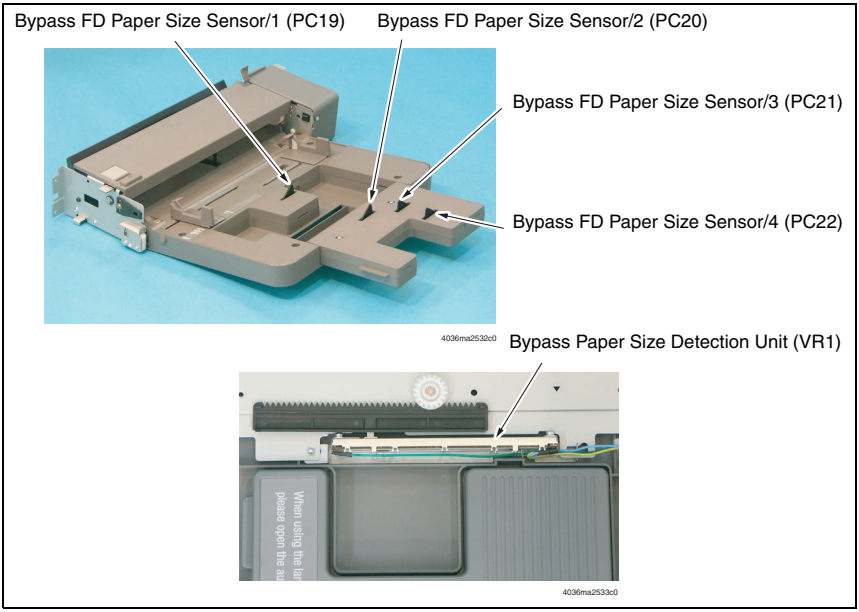
- At the start of a Bypass paper take-up sequence, the Bypass Paper Pick-up Solenoid is energized to raise the Paper Lifting Plate so that the sheet of paper can be taken up. When the print cycle is completed, the Bypass Paper Pick-up Solenoid is energized again to return the Paper Lifting Plate to the standby position.





18.3.4 Paper size detection

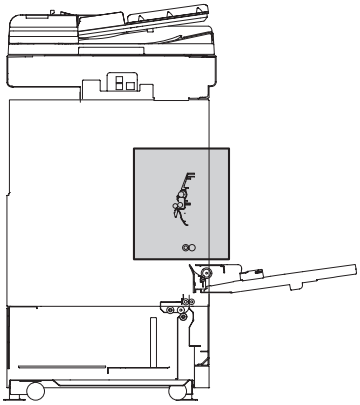
- The size of the paper loaded in the Bypass Section is detected by the combination of ON or OFF positions of the four Bypass FD Paper Size Sensors and the Bypass Paper Size Detection Unit.
- Moving the Paper Guide varies the resistance value of the Bypass Paper Size Detection Unit VR.


Bypass FD Paper Size Sensor/1 (PC19)
Bypass FD Paper Size Sensor/2 (PC20)
Bypass FD Paper Size Sensor/3 (PC21)
Bypass FD Paper Size Sensor/4 (PC22)
4036ma2532c0
Bypass Paper Size Detection Unit (VR1)
4036ma2533c0

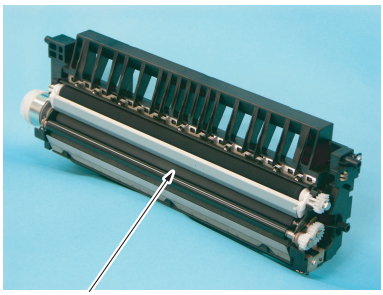
Bypass FD Paper Size Sensor/1 (PC19)	Bypass FD Paper Size Sensor/2 (PC20)	Bypass FD Paper Size Sensor/3 (PC21)	Bypass FD Paper Size Sensor/4 (PC22)	Bypass Paper Size Detection Unit (VR1) Width (mm)	Paper Size Detected
OFF	OFF	OFF	OFF	80 to less than 115	A6R
				115 to 144 inclusive	B6R
				196 to 225 inclusive	A5
				242 to 268 inclusive	B5
ON	OFF	OFF	OFF	133 to 164 inclusive	A5R
				169 to less than 196	B5R
				196 to 225 inclusive	A4R
				225 to less than 288	Letter
				288 to 330 inclusive	A4
ON	ON	OFF	OFF	188 to 235 inclusive	FLS
ON	ON	ON	OFF	201 to 231 inclusive	Legal
				268 to 288 inclusive	B4
ON	ON	ON	ON	255 to less than 288	11 × 17
				288 to less than 301	A3
				301 to 330 inclusive	A3 Wide

19. Synchronizing Roller/Conveyance section

19.1 Composition

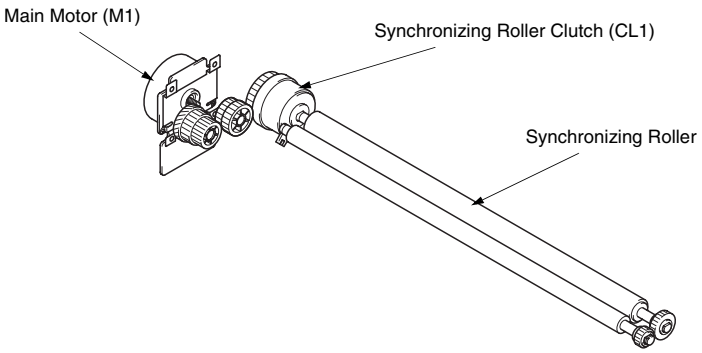


4040T2C516AA



4040T2C539AA

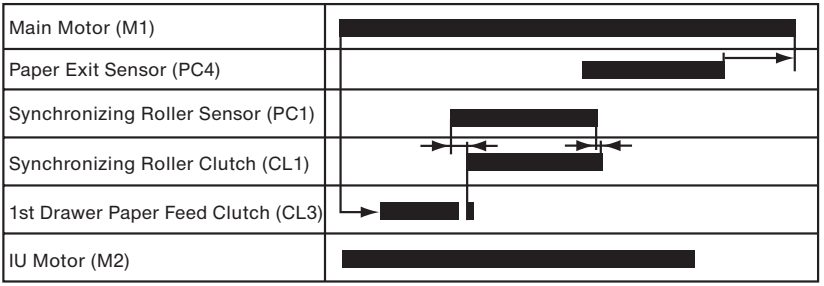
19.2 Drive

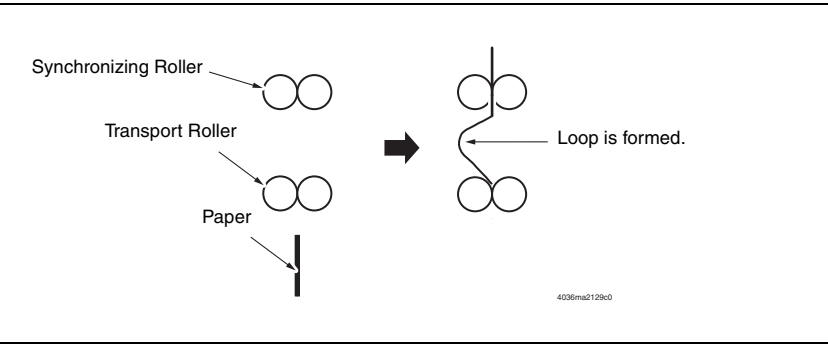


4040T2C559AA

19.3 Operation

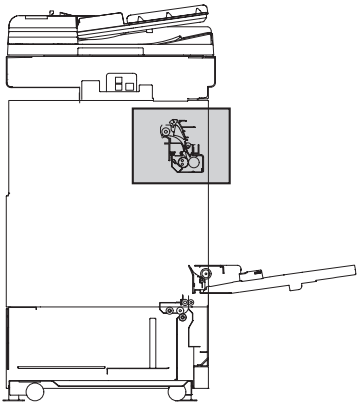
- A loop is formed in the paper between the Transport Roller and Registration Roller during the paper transportation to correct skewed paper feeding. The amount of the paper loop can be adjusted using “Loop Adjust” of the Tech. Rep. mode.
- Changing the adjustment value varies the timing at which the Synchronizing Roller is started.
- The amount of loop can be adjusted for each type of medium loaded in the tray.



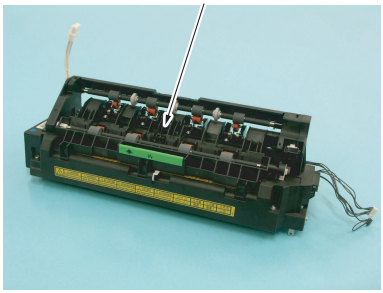


20. Fusing section

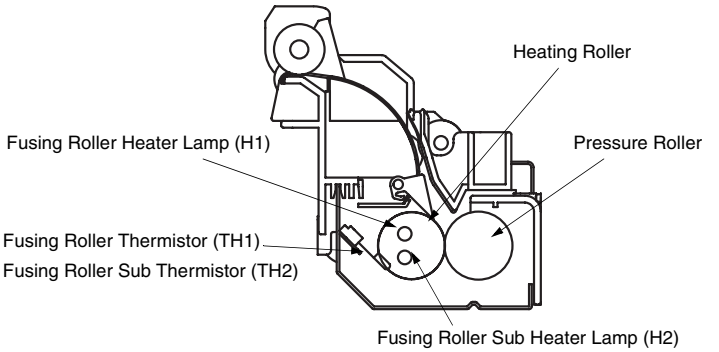
20.1 Composition



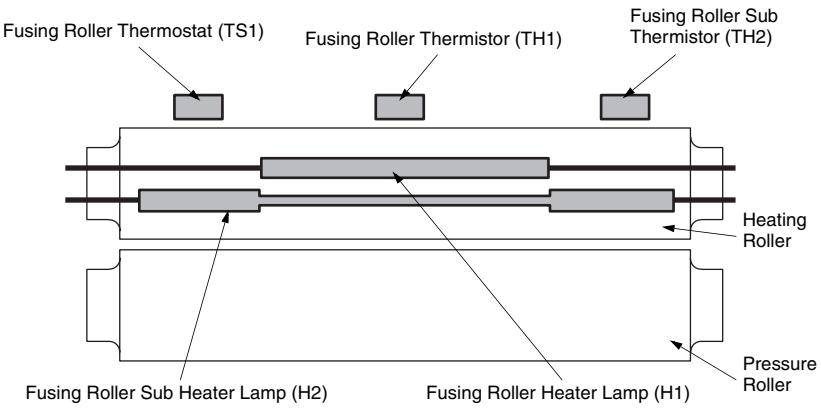
4040T2C517AA



4040T2C540AA

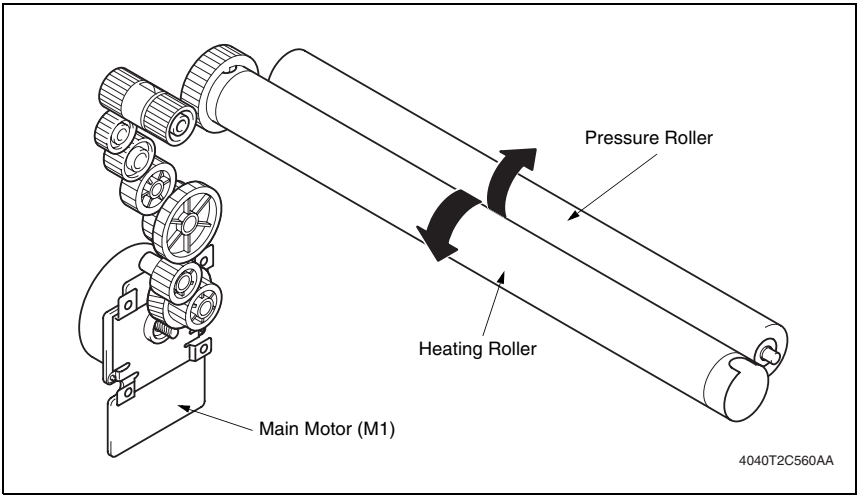

Heating Roller
Fusing Roller Heater Lamp (H1)
Pressure Roller
Fusing Roller Thermistor (TH1)
Fusing Roller Sub Thermistor (TH2)
Fusing Roller Sub Heater Lamp (H2)

4040T2C541AA


Fusing Roller Thermostat (TS1)
Fusing Roller Thermistor (TH1)
Fusing Roller Sub Thermistor (TH2)
Heating Roller
Pressure Roller
Fusing Roller Sub Heater Lamp (H2)
Fusing Roller Heater Lamp (H1)

4040T2C582AA

20.2 Drive


Pressure Roller
Heating Roller
Main Motor (M1)
4040T2C560AA

20.3 Operation

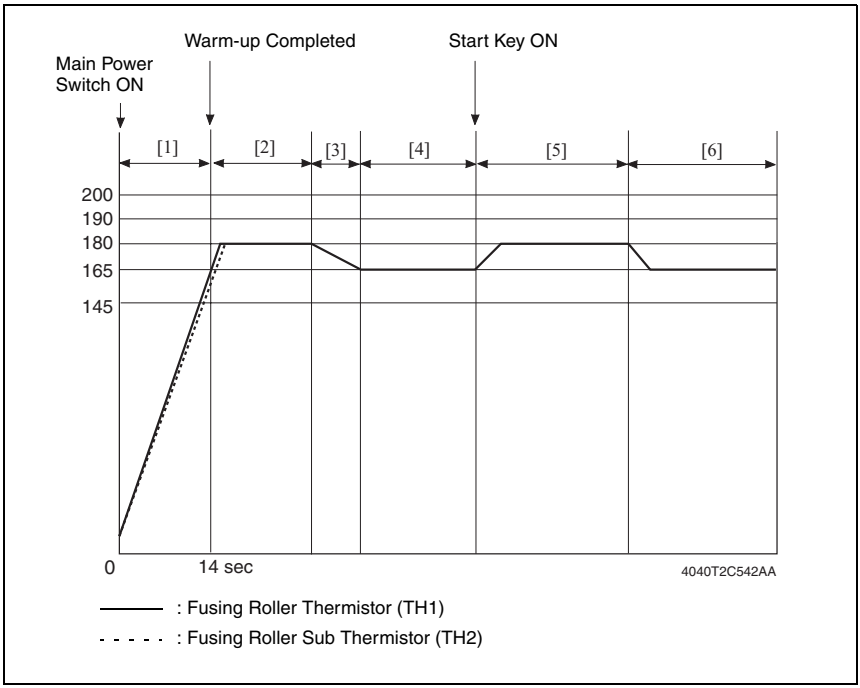
20.3.1 Fusing Roller drive control

- Drive of the Fusing Unit is controlled by the Main Motor.
- The Main Motor drives the Heating Roller and the Pressure Roller is driven by the Heating Roller.

20.3.2 Fusing temperature control

- The surface temperatures of the Heating Roller and Pressure Roller are detected using thermistors and the corresponding Heater Lamps are turned ON or OFF as necessary to maintain the set fusing temperature.

for U.S and Canada area (bizhub 350)



[1] During the warm-up cycle
Heating Roller temperature: 165 °C

[2] In standby state (Mode1) *1
Heating Roller temperature: 180 °C

[3] In standby state (Mode2) *2
Heating Roller temperature: 180 °C -> 165 °C

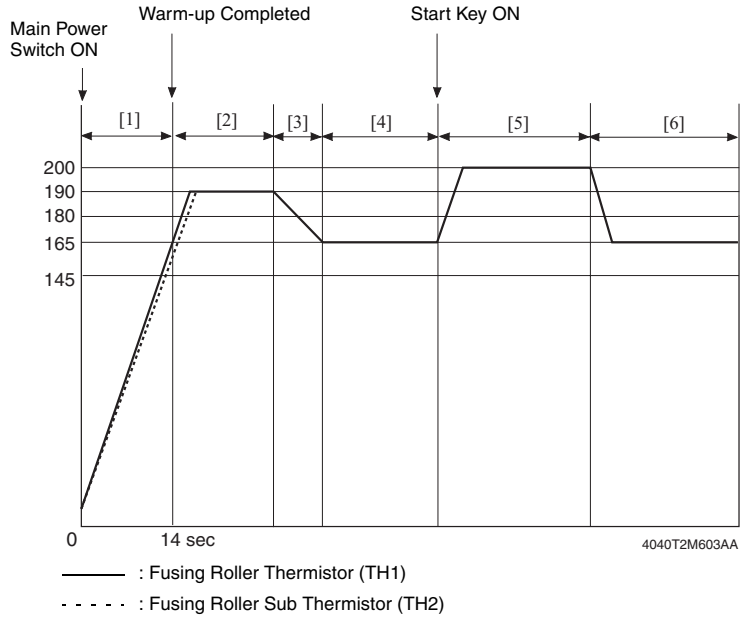
[4] In standby state (Mode3)
Heating Roller temperature: 165 °C

[5] During a copy cycle
Heating Roller temperature: 180 °C *3

[6] In standby state

*1: After the lapse of a predetermined period of time, the set temperature is switched to that in the standby state (Mode2).
*2: After the lapse of a predetermined period of time, the set temperature is switched to that in the standby state (Mode3).
*3: For plain paper measuring 221 mm or more (Mode1).

for Europe area (bizhub 350)



[1] During the warm-up cycle
Heating Roller temperature: 165 °C

[2] In standby state (Mode1) *1
Heating Roller temperature: 190 °C

[3] In standby state (Mode2) *2
Heating Roller temperature: 190 °C -> 165 °C

[4] In standby state (Mode3)
Heating Roller temperature: 165 °C

[5] During a copy cycle
Heating Roller temperature: 200 °C *3

[6] In standby state

*1: After the lapse of a predetermined period of time, the set temperature is switched to that in the standby state (Mode2).
*2: After the lapse of a predetermined period of time, the set temperature is switched to that in the standby state (Mode3).
*3: For plain paper measuring 221 mm or more (Mode1).

A. Warm-up

	Fusing Roller Thermistor (TH1)	Fusing Roller Sub Thermistor (TH2)
Warm-up completion temperature	165 °C	160 °C

B. During a copy cycle (for US and Canada area)

- To achieve the intended level of fusing performance, the set temperature of each roller is varied according to the paper type.

Paper Type	Paper Width	Machine Type	Fusing Roller Thermistor (TH1)	Fusing Roller Sub Thermistor (TH2)
Plain paper	221 mm or more	bizhub 350	180	
		bizhub 250/200		
	220 mm or less	bizhub 350	170	
		bizhub 250/200	160	
Thick paper, Envelopes, Post Card	-	-	200	
OHP	-	bizhub 350	165	
		bizhub 250/200	160	
Thin Paper	-	-	170	

C. During a copy cycle (for Europe area)

- To achieve the intended level of fusing performance, the set temperature of each roller is varied according to the paper type.

Paper Type	Paper Width	Machine Type	Fusing Roller Thermistor (TH1)	Fusing Roller Sub Thermistor (TH2)
Plain paper	221 mm or more	bizhub 350	200 (Mode1)	
			200 -> 190 (Mode2)	
			190 (Mode3)	
		bizhub 250/200	180	
	220 mm or less	bizhub 350	180	
		bizhub 250/200		
Thick paper, Envelopes, Post Card	-	-	200	
OHP	-	bizhub 350	165	
		bizhub 250/200	160	
Thin Paper	-	-	170	

D. In standby (for U.S and Canada area)

	Fusing Roller Thermistor (TH1)	Fusing Roller Sub Thermistor (TH2)
Standby temperature	Mode1: 180 °C Mode2: 180 °C -> 165 °C Mode3: 165 °C	

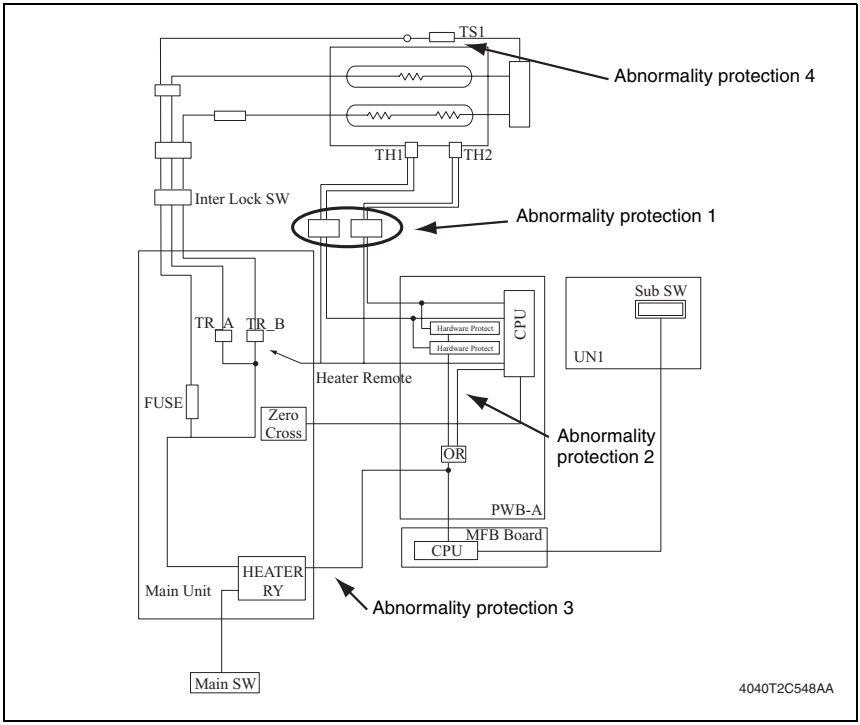
E. In standby (for Europe area)

	Fusing Roller Thermistor (TH1)	Fusing Roller Sub Thermistor (TH2)
Standby temperature	Mode1: 190 °C Mode2: 190 °C -> 165 °C Mode3: 165 °C	

20.3.3 Protection against abnormal conditions

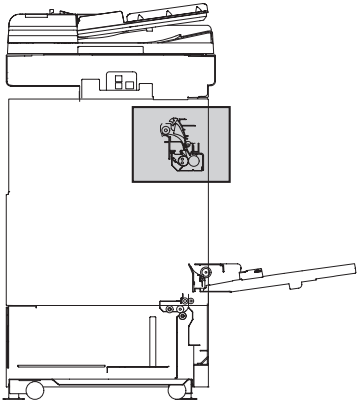
- The machine provides protection against abnormally high temperature of the Fusing Unit in the following four steps.

1. The Fusing Roller Thermistor and the Fusing Roller Sub Thermistor are connected via a short-circuit connector. If a connection failure occurs in the Fusing Roller Thermistor or the Fusing Roller Sub Thermistor as a result of the thermistor's not being connected via the short-circuit connector, a heater remote is cut off. If the above condition is detected, the machine displays the malfunction code representing a warm-up failure and prohibits the initiation of a new copy cycle. (This is an ordinary detection of a warm-up failure.)
2. When the Fusing Roller Thermistor and the Fusing Roller Sub Thermistor detect 230°C due to an abnormally high temperature as a result of a faulty triac or remote driver, the machine displays the malfunction code representing an abnormally high temperature and prohibits the initiation of a new copy cycle. (This is an ordinary detection of a malfunction of an abnormally high temperature.)
3. A different protection is provided when the CPU overruns, becoming unable to detect the malfunction of an abnormally high temperature. If the Fusing Roller Thermistor and the Fusing Roller Sub Thermistor detect 250°C, the heater relay of the Power Supply unit is turned OFF through the Mechanical Control Board and the power supply to each of the heater lamps is shut down. If the detected temperature thereafter decreases, the heater relay is turned ON again and supply of power to the heater lamps is resumed. The sequence of these operations is repeated until the CPU recovers from the overrun and becomes able to detect the malfunction of an abnormally high temperature. This control allows the power supply to each of the heater lamps to be shut down before the corresponding thermostat operates. It thereby suppresses damage to the Fusing Unit itself.
4. If detection of the abnormally high temperature through approaches 1, 2, and 3 above is not possible due to a defective thermistor or other reason, the thermostat comes into play to shut down the power supply to each of the heater lamps. The Fusing Roller Thermostat is rated at 250°C. (Ordinary protection against abnormally high temperatures)


TS1
Abnormality protection 4
TH1
TH2
Inter Lock SW
Abnormality protection 1
Sub SW
CPU
Hardware Protect
Hardware Protect
UN1
TR_A
TR_B
Heater Remote
FUSE
Zero Cross
OR
Abnormality protection 2
PWB-A
MFB Board
CPU
HEATER RY
Main Unit
Abnormality protection 3
Main SW
4040T2C548AA

21. Paper exit section

21.0.1 Composition



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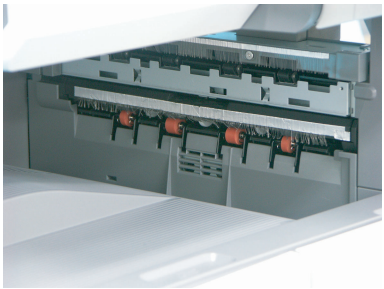

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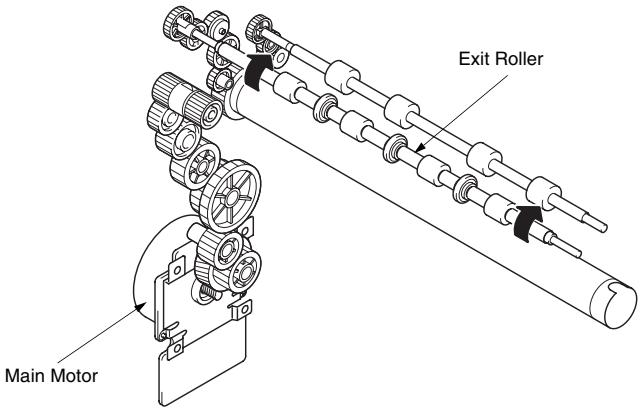
21.1 Drive



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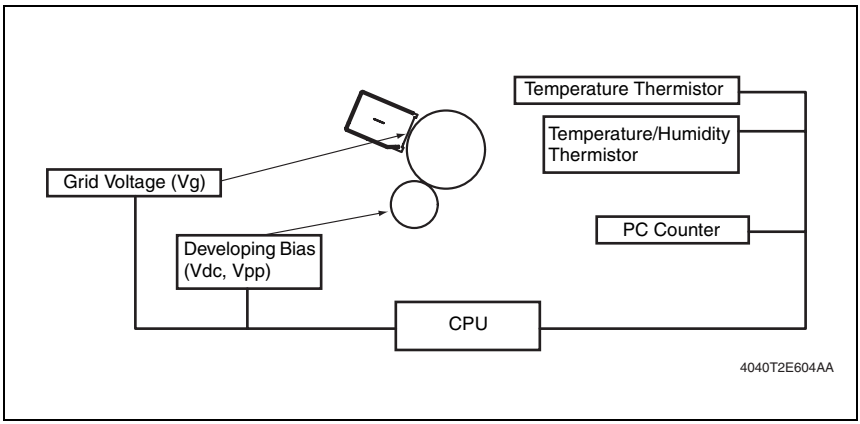
22. Image stabilization control

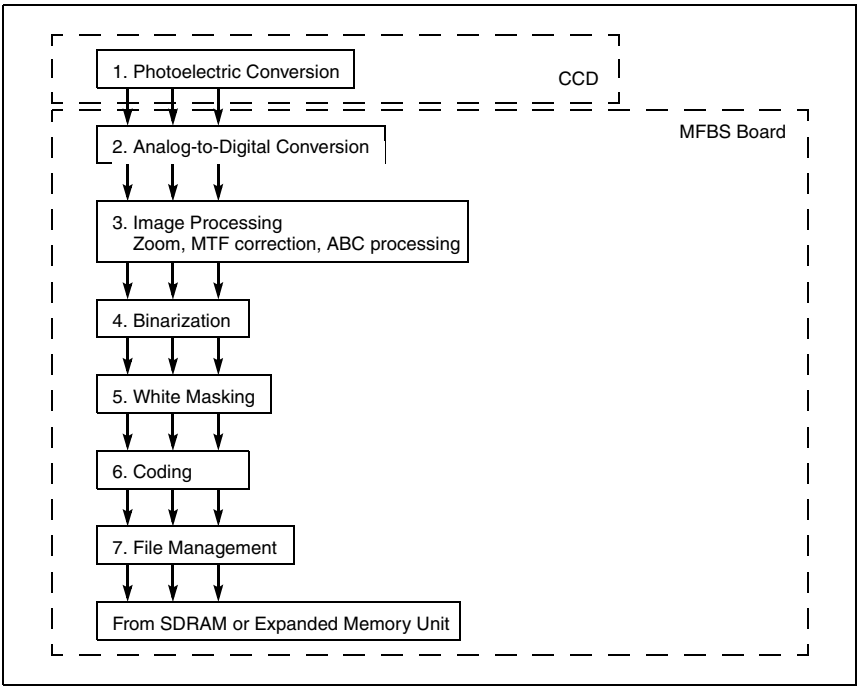
22.1 Overview

- The image stabilization control is provided to ensure that the image quality is consistent, as caused by fluctuating environmental conditions and degraded durability.
- The Temperature Thermistor and Temperature/Humidity Thermistor are installed in the copier to detect the temperature around the Photo Conductor and absolute humidity.
- An optimum grid voltage and optimum developing bias are applied through calculations based on the value detected by the Temperature/humidity Sensor and the period of time through which the Photo Conductor has been rotated.
- The Vpp (Voltage Peak to Peak) value is also varied to prevent image density from becoming low under conditions of high temperature and high humidity when the number of copies made increases.
- Vg/Vdc can also be changed using the Tech. Rep. Mode.



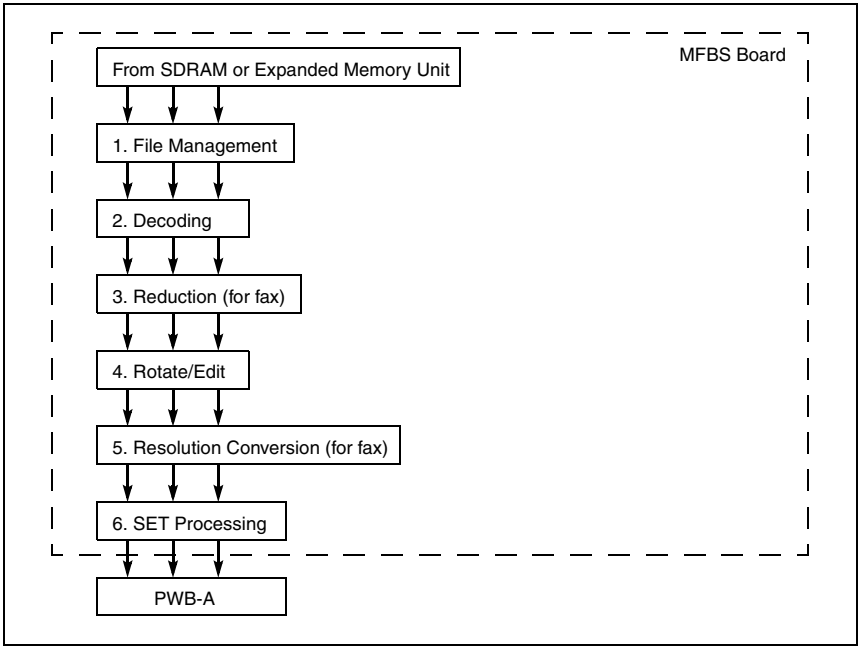
23. Image processing

23.1 Scanner section image processing block diagram



1. The CCD Sensor converts the light reflected off the original to a corresponding electrical signal.
   The analog signal output from the CCD consists of two signals, one representing the even-numbered pixel side and the other representing the odd-numbered pixel side.
2. The two analog image signals generated by the CCD are synthesized and converted to 8-bit digital signals.
3. The following image processing is performed at this step: shading correction (variations in light distribution that varies along the entire length of the Exposure Lamp and in sensitivity of each CCD chip are corrected), gamma (g) correction (processing performed to match CCD sensitivity characteristics with printer sensitivity characteristics), zoom, MTF correction (correction of resolution), and ABC processing (removing the background color of the original).
4. The corrected image data is converted to binary image data through error diffusion processing.
5. The areas outside the original and center portion of an open book are erased.
6. Image data is compressed for efficient use of memory.
7. Data undergoes file management before being stored in the SDRAM on the MFB3 Board or on optional memory.

23.2 Write section image processing block diagram 1

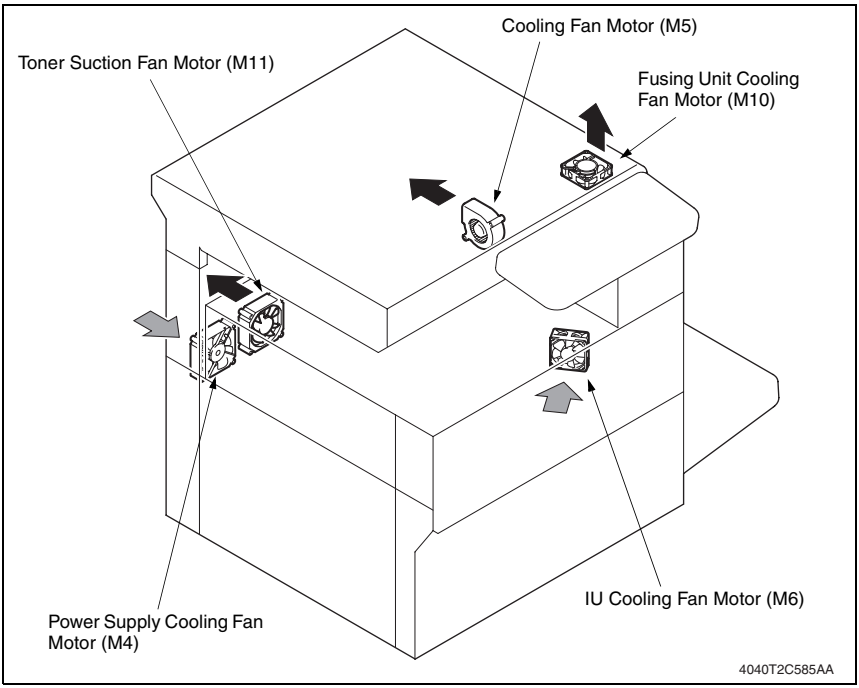


1. The coded data stored in SDRAM is read while subjecting it to file management.
2. The coded data is uncompressed in relation to the original binary data.
3. The data undergoes reduction, if recording paper of an adequate size is not available in fax reception.
4. The image data is temporarily stored in SDRAM for image rotation, if it is to be rotated or edited.
5. Resolution conversion is then carried out to match the resolution received by the fax with that of the printer engine.
6. For PC print, SET processing is performed, in which resolution is enhanced.

24. Other control

24.1 Fan control

24.1.1 Construction


Cooling Fan Motor (M5)
Toner Suction Fan Motor (M11)
Fusing Unit Cooling Fan Motor (M10)
Power Supply Cooling Fan Motor (M4)
IU Cooling Fan Motor (M6)
4040T2C585AA

24.1.2 Operation

A. Function

Motor Name	Control Conditions
Power Supply Cooling Fan Motor (M4)	• It exhausts the accumulated heat inside the unit in order to prevent temperature from increasing at DC power supply part.
Cooling Fan Motor (M5)	• The Ozone Filter traps to remove odor stagnant inside the machine. • Heat accumulated inside the machine is discharged out to prevent the interior temperature from rising inordinately.
IU Cooling Fan Motor (M6)	• The Ozone Filter provided in the IU traps to remove ozone stagnant in areas near the PC Drum Charge Corona. • Heat stagnant in the Fusing Unit is discharged out of the machine.
Fusing Unit Cooling Fan Motor (M10)	• Heat accumulated inside the machine is discharged out to prevent the temperature of the Fusing Unit from rising inordinately.
Toner Suction Fan Motor (M11)	• The Toner Filter traps toner particles that have scattered during developing.

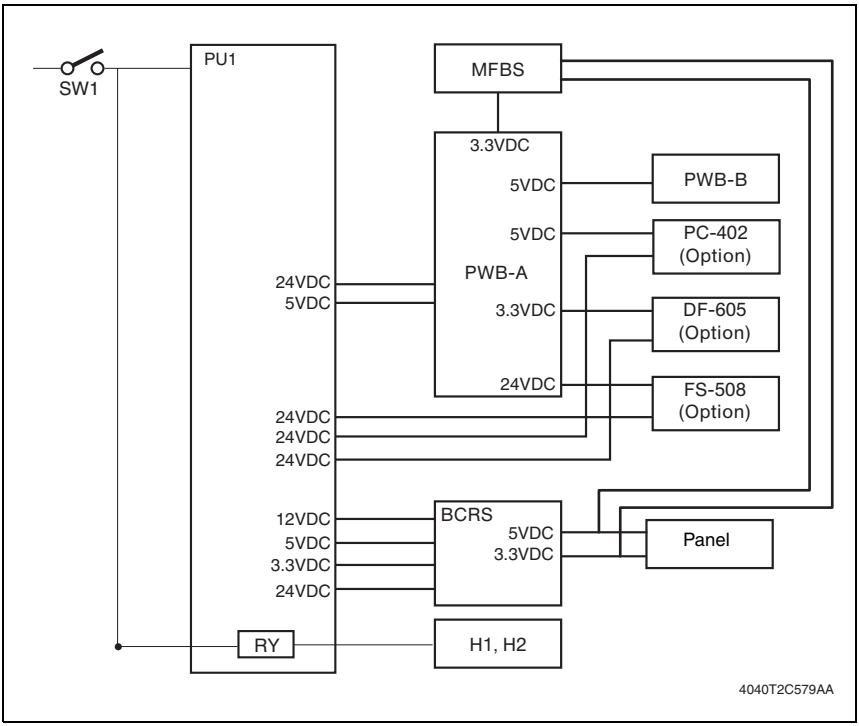
B. Fan control

Motor Name	Control	Control Conditions
Power Supply Cooling Fan Motor (M4)	Full speed	• When power is turned ON or Sleep is reset
	Half speed	• Half speed if the Main Motor (M1) is deenergized at any timing after the lapse of a predetermined period of full speed rotation
Cooling Fan Motor (M5) IU Cooling Fan Motor (M6)	Full speed	• During a print cycle or after the lapse of a predetermined period of time after the stop of the print cycle
	Half speed	• After the completion of the warm-up cycle or full speed rotation
	Stop	• During a warm-up cycle
Fusing Unit Cooling Fan Motor (M10)	Full speed	• During a print cycle or after the lapse of a predetermined period of time after the stop of the print cycle
	Stop	• After the completion of full speed rotation
Toner Suction Fan Motor (M11)	Full speed	• Full speed when the IU Motor (M2) is energized
	Stop	• When the IU Motor (M2) is deenergized

24.2 Parts Operated When the Power Switch and Auxiliary Power Button are turned ON

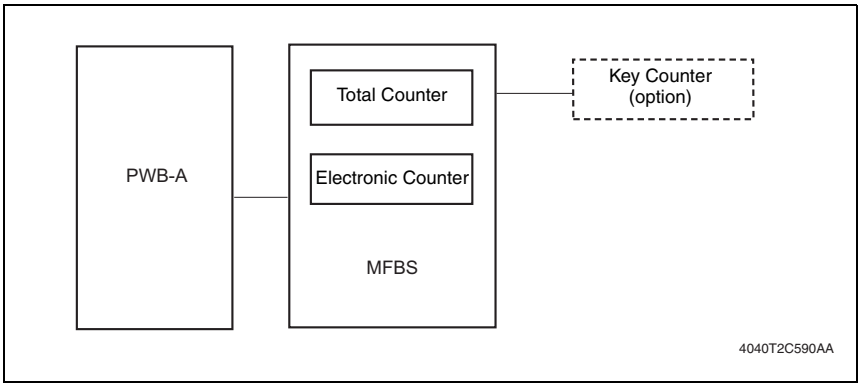
24.2.1 Parts operated when the Power Switch and Auxiliary Power Button are turned ON

- When the Auxiliary Power Button is turned ON, the Control Board detects it and sends a control signal to the DC Power Supply.
- The DC Power Supply then supplies 3.3V DC, 5V DC, 15V DC, and 24V DC to all PWBs and options. It also turns ON the relays in the PWBs, supplying AC power to each of the heater lamps.



24.3 Counter control

24.3.1 Construction



Name	Function
Total Counter	• Shows the cumulative number of copies made in all copy modes • A mechanical counter driven by an electric signal • Counts one when an exit signal is applied to it
Electronic Counter	• Shows the cumulative number of copies made or printed pages produced in each of different copy or print modes • Counts one when an exit signal is applied to it
Key Counter (option)	• The counter that disables copying when counting the predetermined number of copies • A mechanical counter driven by an electric signal • Counts one when a paper take-up start signal or image forming start signal, whichever occurs earlier, is applied to it

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KONICA MINOLTA

SERVICE MANUAL

THEORY OF OPERATION

FK-503

2005.08

KONICA MINOLTA BUSINESS TECHNOLOGIES, INC. Ver. 1.0

Revision history

After publication of this service manual, the parts and mechanism may be subject to change for improvement of their performance.
Therefore, the descriptions given in this service manual may not coincide with the actual machine.

When any change has been made to the descriptions in the service manual, a revised version will be issued with a revision mark added as required.

Revision mark:

- To indicate clearly a section revised, show to the left of the revised section.
  A number within represents the number of times the revision has been made.

- To indicate clearly a section revised, show in the lower outside section of the corresponding page.
  A number within represents the number of times the revision has been made.

NOTE

Revision marks shown in a page are restricted only to the latest ones with the old ones deleted.

- When a page revised in Ver. 2.0 has been changed in Ver. 3.0:
  The revision marks for Ver. 3.0 only are shown with those for Ver. 2.0 deleted.
- When a page revised in Ver. 2.0 has not been changed in Ver. 3.0:
  The revision marks for Ver. 2.0 are left as they are.

2005/08	1.0	—	Issue of the first edition
Date	Service manual Ver.	Revision mark	Descriptions of revision

CONTENTS

FK-503

Outline

1. Product specifications 1
2. Circuitry Operation 4

Composition/Operation

3. Summary of Board functions 5
3.1 MFBS Board 6
3.1.1 Main Controller 6
3.1.2 Reading Controller 8
3.1.3 Image Data Processor 10
3.1.4 Network Control 12
3.1.5 Expansion Interface 13
3.2 FAX Board 14
3.2.1 Overview 14
3.2.2 Block diagram 14
3.2.3 Function 14
3.3 RAMS Board 16
3.3.1 Overview 16
3.3.2 Block diagram 16
3.4 BCRS Board 17
3.4.1 Overview 17
3.4.2 Block Diagram 17
3.5 MEM Board 18
3.5.1 Overview 18
3.5.2 Block diagram 18
3.6 MEMS Board 19
3.6.1 Overview 19
3.6.2 Block Diagram 19
4. Communication Control 20
4.1 V.34 Mode Communication Procedure 20
4.1.1 V.34 Mode Communication Procedure 22
4.2 Communication Mode 23
4.2.1 Priority 23
4.2.2 Communication modes of ECM/G3 23

4.3 Encoding Method 24
5. Selecting Print Paper 25
5.1 Printing Area 25
5.2 Printing Mode 26
5.2.1 Automatic reduction mode 26
5.2.2 Cut off mode 26
5.3 Print Paper Selection Mode (FAX) 27
5.3.1 Standard mode 27
5.3.2 Width preference mode 27
5.3.3 Fixed width mode 28
5.3.4 Print paper size selections (when receiving) 30
5.3.5 Paper detection <Method to declare print paper size to facsimile of other party when print paper has run out> 31
6. List of Reports 32
6.1 Activity Report (TX) 33
6.2 Activity Report (RX) 34
6.3 Protocol Trace 35
6.3.1 G3 Protocol Trace 35
6.4 Network Protocol Trace 36
6.5 Memory Dump & File Dump 36
6.6 Service Call Report 37
6.6.1 Content 37

Outline

1. Product specifications

A. Type

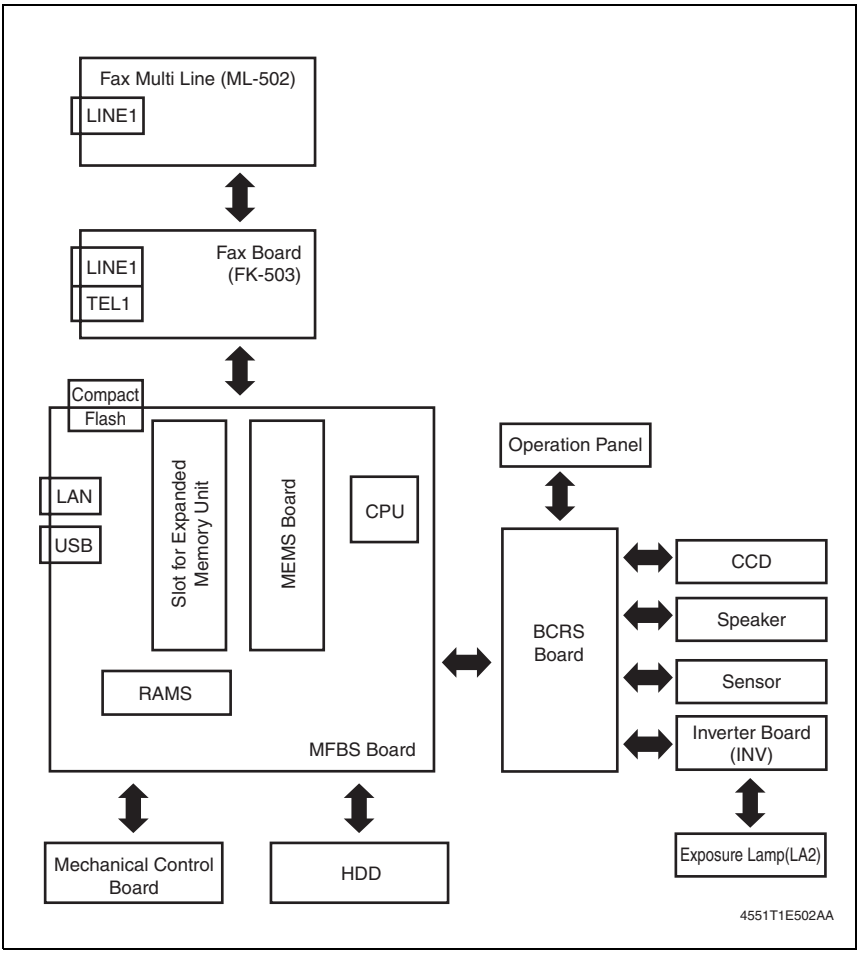
Memory Capacity	32MB	
Communication mode	G3/ECM	
Scanning resolution (main line x feed line)	8 x 3.85 line/mm 8 x 7.7 line/mm 8 x 15.4 line/mm 16 x 15.4 line/mm	
Data speed	G3 / ECM: 2.4 Kbps - 33.6 Kbps	
Transmission time	G3 / ECM: Image signal - 2 sec approx. (V.34 JBIG)	
Coding method	MH / MR / MMR / JBIG	
Applicable network	G3/ECM	Phone line, FAX communication network, dedicated line
Options	Stamp Unit SP-501 Fax Multi Line ML-502	

B. List of Functions

Function		bizhub 350, 250, 200
Speed	High speed scanning	O (0.55 sec/Letter fine)
	High speed printout	O bizhub 350 35 ppm/A4 bizhub 250 25 ppm/A4 bizhub 200 20 ppm/A4
	ECM mode	O (2 sec approx./Std document)
	High speed half tone	O
Resolution	Super fine mode	O
	Half tone transmission	O
	Auto retransmission after error	O (ECM)
	Full automatic exposure control	O
	Manual brightness control	O (Only for copy)
	Smoothing	O
	Mixed mode (Text + Photo)	O
Operability	One-touch dialing	O (540 destinations)
	Abbreviated dialing	-
	One-touch program dialing	O (30)
	Auto re-dialing	O
	Transmission Booking	O (200)
	Broadcast Destination	O (300)
	Origination Selecting	O (8 types)
	LCD display	O (320 x 240)
	Operation	O (Analog touch panel)
	Disable copy function	-
	Select auto-mode screen	O (Copy/Fax automatic switch)
Utility functions	Automatic selection of print paper size	O
	Password communication	O
	Multi polling	-
	Polling at regular times	-
	Nonstorage transmission	O
	Priority transmission	O
	Insert destination	O
	Message printing	-
	Automatic pause for PSTN number	O
	Display communication result	O
	Record TSI information	O
	ID display/record	O (Received date and time record)
	Power Source saving mode	O
	Switch document reading length (1m/4m)	-
	ADF 2 sided transmission	O

Function		bizhub 350, 250, 200
Report functions	Activity report (TX/RX)	O
	Transmission report	O (with document merge)
	Incompleted transmission report	O (with document merge)
	Serial broadcast report	O (with document merge)
	Account list	-
	One-Touch list	O
	Fax program list	O
	Bulletin Board list	O
	Confidential list	-
	Forwarding list	O
	Setting list	O
Memory functions	Multi access	O
	Transmission Booking Document Number	O (200)
	Retransmission	O (Destination changeable)
	Document retransmission	O
	Reception by memory	O
	Transmission Management Document Number	O (200)
	Batch Tx	O (30 destinations)
	Memory polling transmission	O
	Confidential transmission Confidential print	O (F code)
	Serial broadcast	O (300 destinations)
	Relay broadcast	O (F code)
	Memory full control	O (Separate Tx)
	Quick memory transmission	O
	File backup	O (12H)
	Rotated Rx	O
	Selective polling	O
System Configuration	Relay transmission	-
	Extra telephone	O (PB forwarding reception possible)* *PSTN (Port 1 only)
	Account track mode	O (100 sections)
	Chain dialing	O
	Multi-port	O (G3 multi-option)
	Hard disk	-
	Inch/mm conversion	O
	Memory	O (32MB)
Mutual Connectivity	ITU-T G4	-
	ITU-T G4/ECM	O
	Facsimile communication network	O (G3)
Maintenance	Self diagnostics	O
	Counter per application	O
	Adjust touch panel registration	O

2. Circuitry Operation



Composition/Operation

3. Summary of Board functions

Name	Description
MFBS Board	This Board is a micro program control circuit that forms the nucleus of the PMC RM5231A external 32 bit RISC processor, and performs control of the control circuit of each PKG by software. As the primary functions, it possesses reading circuit, recording controls, structural controls, operating controls, reading controls, CCD driver circuit, CCD output image process circuit, binary image process circuit, motor controls circuit, different types of sensor I/F circuits, PC printer function (USB), network function (LAN), Compact Flash I/F, and expansion memory I/F.
BCRS Board	This Board performs the relay between the MFBS board and the book scanner unit circuit. The relay interfaces include the operation panel (OPE) I/F, BS sensors I/F, CCD I/F, S motor I/F, and Xe lamp I/F. Also, it provides from the BCRS board to each Board the power supply provided to the Scanner unit.
FAX Board	This Board is equipped with a V.34 FAX modem to realize FAX communication. This PKG possesses a line controller to detect line signals such as line connection and ringer, as well as a telephone function I/F that realizes FAX/TEL automatic switching.
RAMS Board	This Board mounts non-volatile memory (32MB) for storing S/W onboard, and is used as a program ROM. This PKG also possesses BOOTROM, clock IC circuit, SRAM circuit for storing different types of registration information, battery back-up circuit (lithium battery) for SRAM circuit, and battery backup circuit (Ni-MH battery) for file memory.
MEM Board*	This Board has 32MB capacity used for image data recording.

*: Option Expansion Memory, Scanner Unit

3.1 MFBS Board

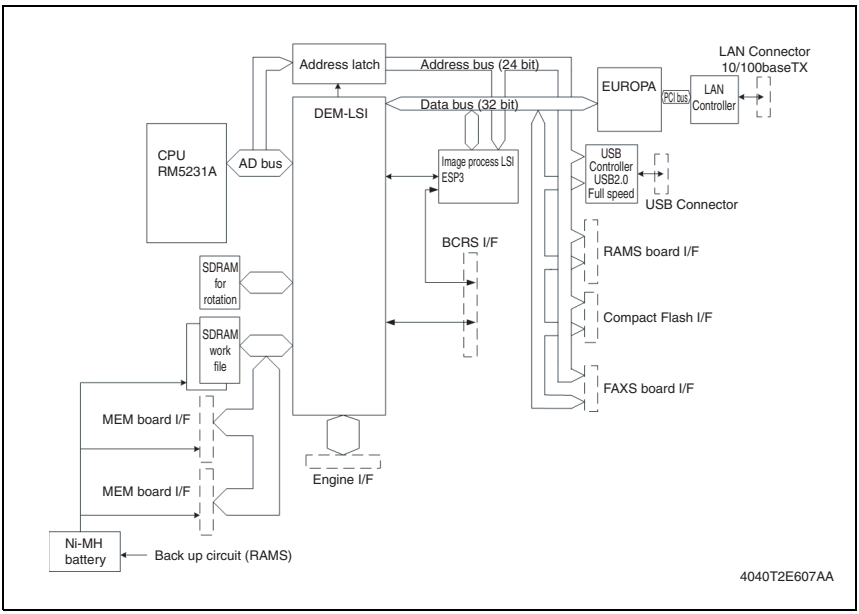
- The MFBS board is a main controller that has an external 32 (internal 64) bit RISC processor, and controls circuits by software. As the primary functions, it controls the transmitter, reader, printer, mechanically moving parts, operation unit, and network.

3.1.1 Main Controller

A. Overview

- The main controller has a RM5231A CPU and a DEM LSI for controlling several blocks, and work memory (SDRAM).
- The main controller also uses the information of the backup memory (SRAM) mounted on ROM board for various controls.

B. Block diagram



C. Function

(1) RM5231A

- This is the CPU of the system. It is an external 32 (internal 64) bit RISC processor.

(2) DEM LSI

- It connects the CPU and the controller for controlling overall operation of the system.

(3) Program memory (RAMS board section)

- The program board with software for operating the system is mounted here. The program is downloaded to the work memory (SDRAM) on MFBS when the power is turned ON. The program starts on the work memory.

(4) Work memory (SDRAM)

- This memory serves the work area of the system operation.

(5) Backup memory (SRAM)

- It is a 512 KB capacity memory that stores the status information of the system.

D. Backup function

(1) Method

Backup location	Method	Lifetime	Voltage/current
Battery backup memory	Lithium battery (discharge type)	5 years approx.	3 V/600 mA
Clock LSI			

(2) Backup contents

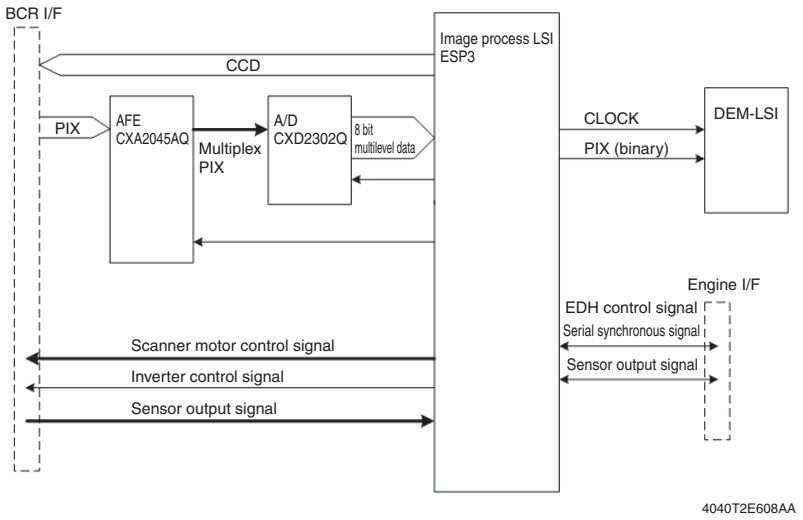
Back up location	Contents
Battery Backup RAM	Phone number: Abbreviated phone numbers
	Self-data: TSI information and serial number are backed up
	Soft switch: Registration data of soft switches
	Communication management: Information on activity reports
Clock LSI	Time count

3.1.2 Reading Controller

A. Overview

- This controller performs reading controls that form the nucleus of the ESP3 LSI. It has a CCD output image process circuit, binary image process circuit, motor control circuit and sensor I/F circuit.

B. Block diagram



C. Function

(1) CCD driver circuit

- Necessary blocks are formed for the CCD drive with a built-in ESP3 LSI.

(2) CCD output image process circuit

<Analog process circuit>

- It performs black label play, gain adjustments and dual mixing after S/H for 2 image signals input from the CCDS board (corrects the level for 2 CCD image signals and converts 1 image signal) then outputs to an A/D converter.

<A/D converter>

- It converts analog signals output from the CXA2045Q to 8-bit digital parallel signals per pixel then outputs to the ESP3 LSI.

<Binary image process circuit>

- It has a built-in ESP3 LSI. It normalizes (shading correction) the 8-bit image signal input from the A/D converter and performs high quality image processing (gamma correction, dither, error dispersion). The image signal processed by performing image enlargement, reduction and white master processing is converted to serial data.

<Motor control circuit>

- It has a built-in ESP3 LSI. It outputs signals for controlling the Book scanner and EDH scanner motors, excitation pattern controls and current controls.

<Sensor I/F circuit>

- It has a built-in ESP3 LSI. Sensor data from the EDH (document size, document edge position, cover switch, etc.) are input. It also has a chatter removal circuit for the signal from the sensor.

<EDH I/F>

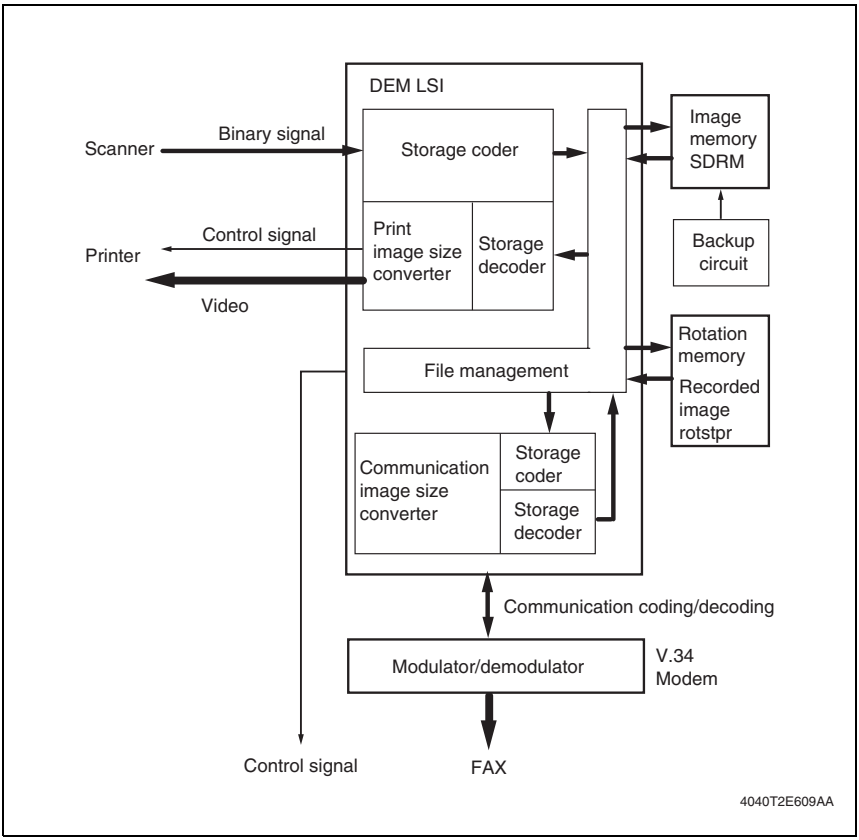
- It has a built-in ESP3 LSI. It transmits commands to the EDH and receives the status.

3.1.3 Image Data Processor

A. Overview

- This processor has interface blocks with the BS unit or the printer units, and the Fax communication block. It has a storage coder/decoder and a storage code memory manager (DEM LSI), image memory (SDRAM FILE), a printer controller (DEM LSI), a modem (V.34), and a communication controller (DEM LSI).
- Each block is controlled by the CPU (RM5231A) of the MFBS board.
- The image memory has an external Ni- MH battery for backup.

B. Block diagram



C. Function

(1) Storage coder/decoder (DEM LSI)

- The coder function codes image data into stored code data. The decoder function decodes stored code data into image data.

(2) Image memory manager (DEM LSI)

- This block reads/writes the stored code data through interface units (the scanner, the printer, and the communication units) from/into SDRAM FILE by the unit of 1 block.

(3) Image memory (SDRAM FILE)

- Standard system comes equipped with 64 MB on the MFBS board.
- The maximum capacity is 192 MB by installing another MEMS board.

(4) Printer controller (DEM LSI)

- It processes the line density conversion for print image data (serial data) from the storage decoder, and stores it in the internal frame memory. The converted data is read synchronized with the PPC printer, added with information on the left margin and the white mask, and then output to the printer as serial data. The frame memory can hold up to 20 KB of data to be output to the printer. The printer controller exchanges commands/statuses for controlling the printer unit.

(5) Image memory backup circuit

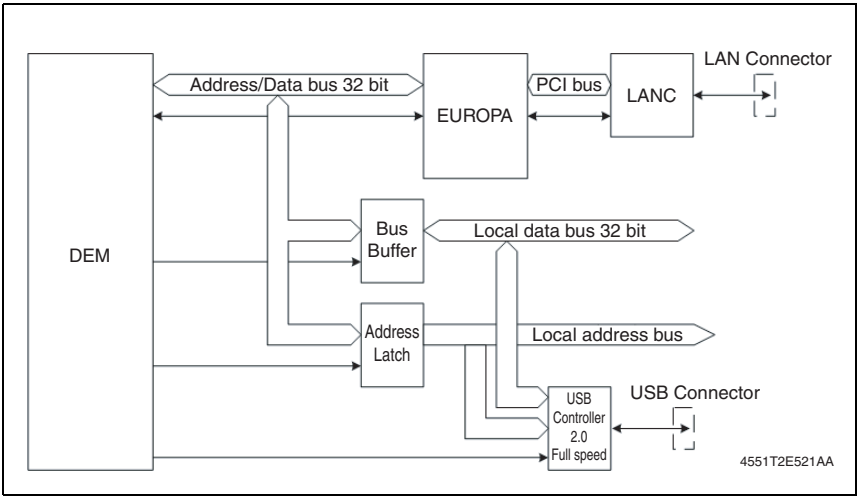
- It retains memory contents for the maximum of 192 MB image memory by switching the power source from the battery to it when the device power is off or the power supply is cut off.

3.1.4 Network Control

A. Overview

- This control unit provides for the network LAN (10BaseT/100BaseTX) interface by the PCI bus and the USB2.0 (full speed) interface that can be used for the PC printer.

B. Block diagram



C. Function

(1) USB2.0 full speed interface

- This can be used for the PC printer by USB connection.

(2) Network LAN interface

- This possesses a 10BaseT/100BaseTX connector for connecting to the network, and can be used for the network printer and network scanner.

LED indicators of LAN connector

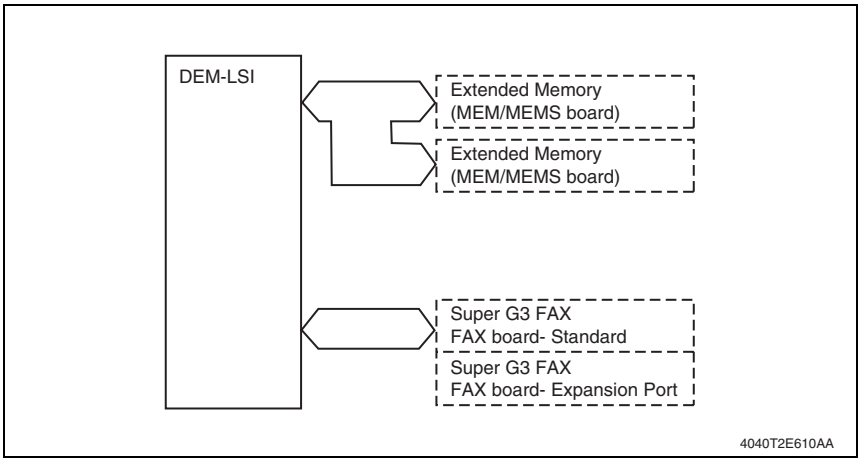
LED	Status	Meaning
Green	Lit	Operating at 100Mbps (connected to HUB of 100BaseTX).
	Blinking	Sending/receiving data at 100Mbps.
	Out	Power is OFF. Not connected correctly to LAN.
Yellow	Lit	Operating at 10Mbps (connected to HUB of 10BaseT).
	Blinking	Sending/receiving data at 10Mbps.
	Out	Power is OFF. Not connected correctly to LAN.

3.1.5 Expansion Interface

A. Overview

- This interface block has an expansion interface for various system options.

B. Block diagram



C. Function

(1) Special connector Expansion slot

- Use them to add file memories at expansion slot. There are 3 boards that can be connected.
- Expansion slot 1: MEMS (128MB)
- Expansion slot 2: MEM (32MB) file memory, scan option

(2) FAX board interface

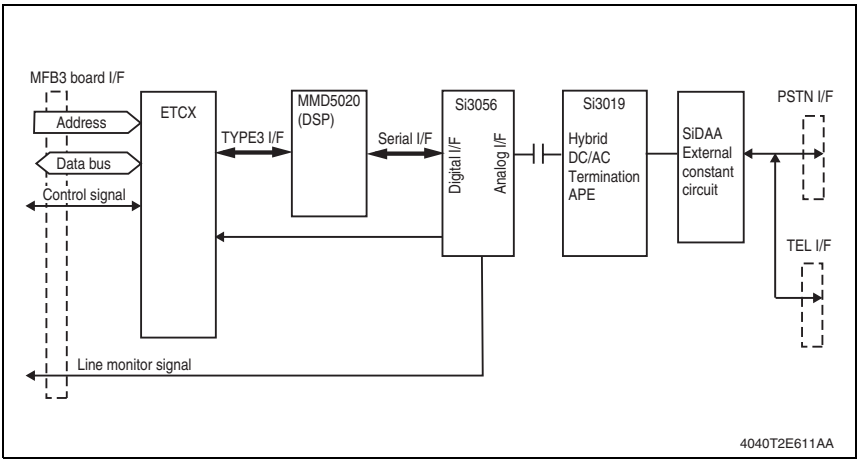
- FAX board interface
- A connector equipped with the FAX board for V.34 Fax.
- This interface is shared by the basic port and a multi-port of the Fax board.

3.2 FAX Board

3.2.1 Overview

- This board comes loaded with a G3 modem for communicating Super G3 facsimile communications. Cascade connection of two identical fax boards easily achieves a multi-port.

3.2.2 Block diagram



3.2.3 Function

A. Modem DSP (MMD5020 V.34 modem)

- A digital signal processor (DSP) and a ROM/RAM are integrated in this modem chip.
- A modem F/W ROM and Boot memory (SRAM) are built in the modem.
- The communication operation conforms to the ITU-T recommendation V.8, V.34, V.17, V.29, V.27ter and V.21ch2.
- It can be operated at speeds from 33.6 kbps to 2.4 kbps (2.4 kbps steps) and 300 bps. The basic specification for the recommendation is the same as before.
- It also transmits PB tones when calling PB via Line controller.
- This modem is positioned on the memory map on the MFBS board.
- The analog circuit block following the analog front-end section (AFE) to convert A/D and D/A are processed in the Line controller.

B. Communication controller (ETCX LSI)

- It possesses an interface for the host (MFB3 board) to access to the modem DSP (data, address, interruption and CS decoding).
- It possesses a ringer detection function using binary output from the silicone DAA.
- It has a cascade connection function to achieve multi-port.
- It enables multi-port communication by connecting two identical fax boards.

C. Image memory backup circuit (Si3056 silicone DAA)

- The silicone DAA (Direct Access Arrangement) processes almost all kinds of analog communications for blocks following the modem DSP or blocks from the analog front-end section (AFE) to the line.
  Its main functions are as follows.

• Isolation function for line side first system line and the second system line (*1)
• A/D and D/A conversion function (CODEC)
• Analog hybrid (HYB) circuit
• Monitoring function for Tx/Rx analog circuit and line
• Direct current loop (DC termination) adjustment function (*2)
• 600 W termination alignment (AC termination) function
• Ringer signal detection (binary) function
• Dial pulse generation and output function
• Line direct current polarity monitoring function

*1: The function substitutes for the existing transformer and a photo coupler.
*2: Performs CML on/off (connection/release) and detects connected telephone off hook. Therefore no relay operation sound occurs unlike before.

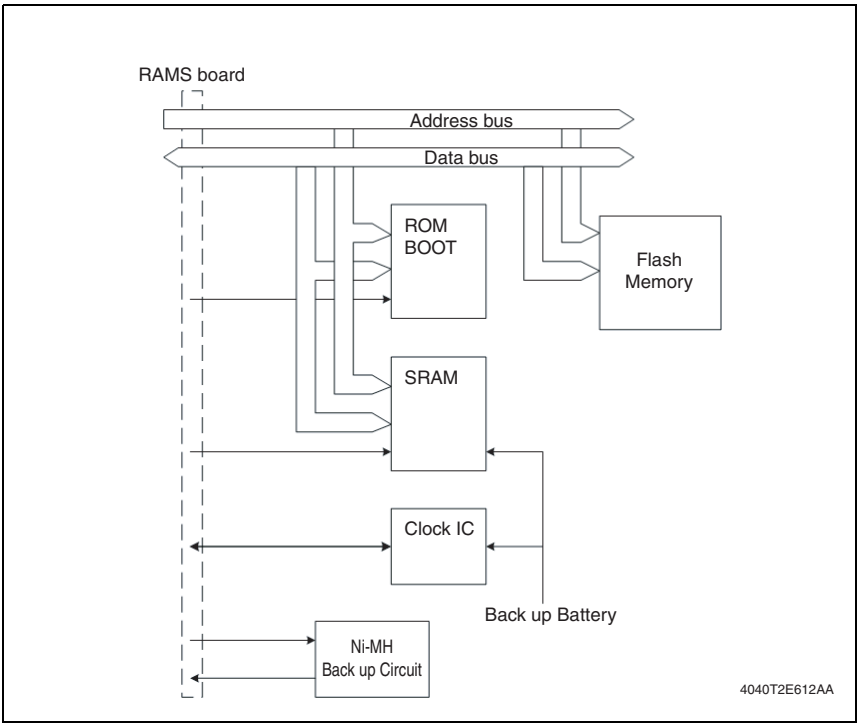
- This board consists of 2 tips (Si3056 and Si3019) and is positioned on the same memory area with the modem DSP. All communication protocol signals, image signals, ringer binary signals and tonal signals are superposed on a 2 MHz modulation signal unique for the silicone DAA and transmitted.
- The Si3056 tip on the DSP side uses +3.3 V power supply in common with the modem DSP. The Si3019 tip operates by the line superposition DC 48 V.
- Therefore, the board does not operate in the communication line without power supply (Back to back). It always needs to be connected with such as the pseudo exchange in the communication test.
- The board has two modular connection ports (for line connection and connected telephone connection).
- When connecting the public line to the line connection modular port of the board, use the attached 2-core cable.
- When operating the device with the 4-core cable connected, malfunction may occur.

3.3 RAMS Board

3.3.1 Overview

- This board mounts a flash memory storing the program to operate the system.
- It also has a clock IC circuit, a SRAM circuit for storing different types of registration information, and a file memory backup circuit by an Ni-MH battery.

3.3.2 Block diagram

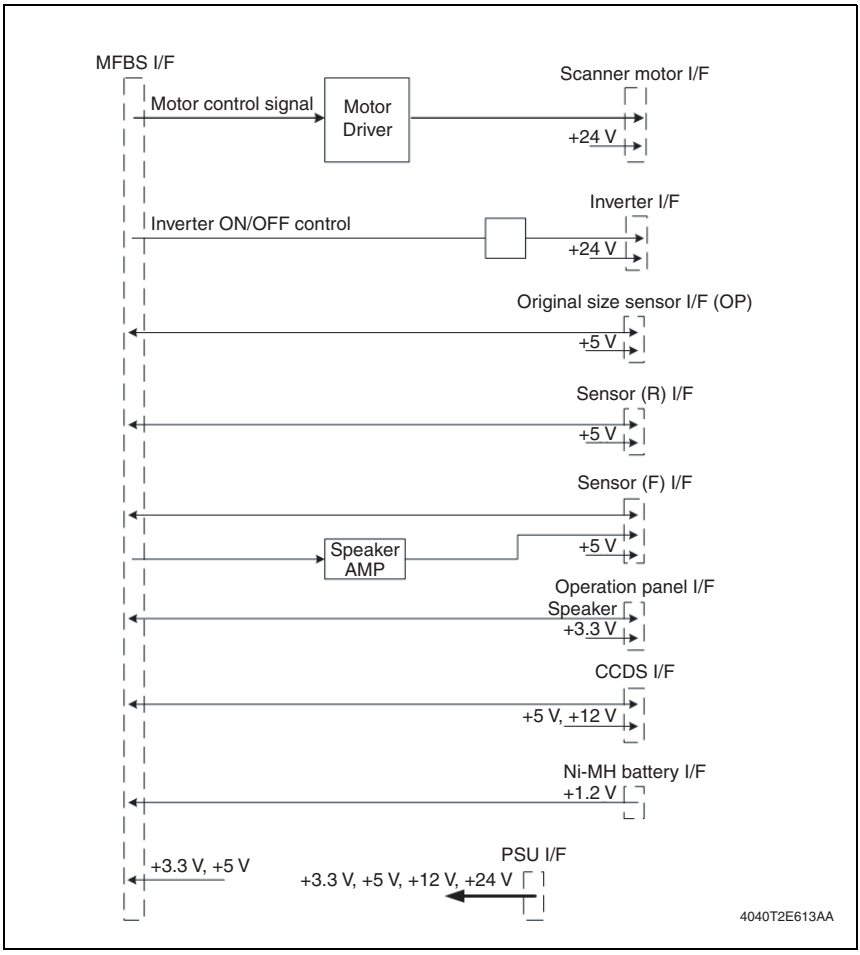


3.4 BCRS Board

3.4.1 Overview

- The BCRS relays between the MFBS board and the Xe lamp and S motor of the Scanner unit, the CCDS board, and the Operation Panel, and various sensors.
- It has a motor driver.

3.4.2 Block Diagram

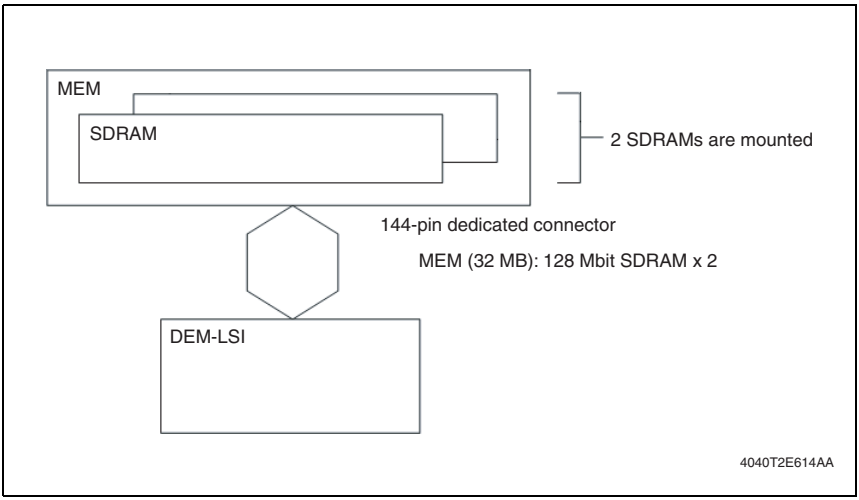


3.5 MEM Board

3.5.1 Overview

- This board is used as memory for image information for expansion.
- Its memory capacity is 32 MB.
- Insert this board into a memory expansion slot of the MFBS board.

3.5.2 Block diagram

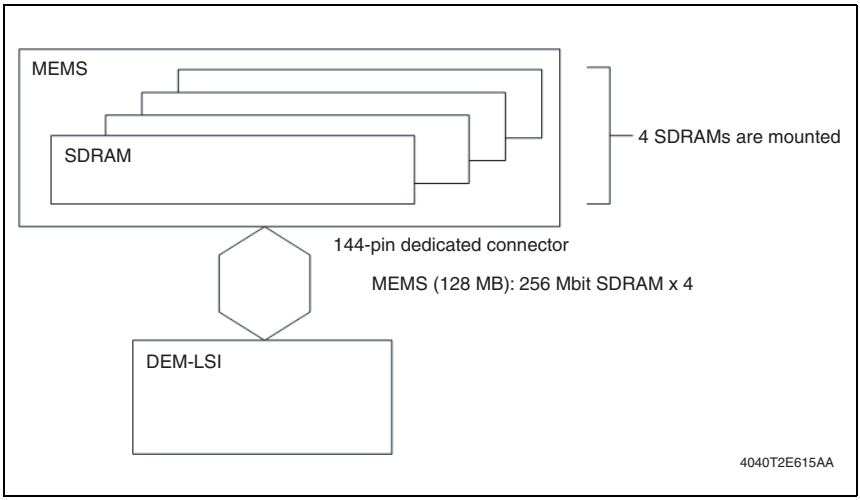


3.6 MEMS Board

3.6.1 Overview

- This board is used as memory for image information for expansion.
- Its memory capacity is 128 MB.
- Insert this board into a memory expansion slot of the MFBS board.

3.6.2 Block Diagram

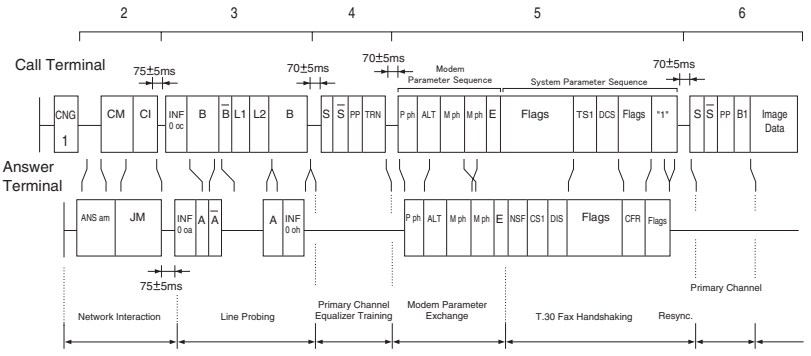


4. Communication Control

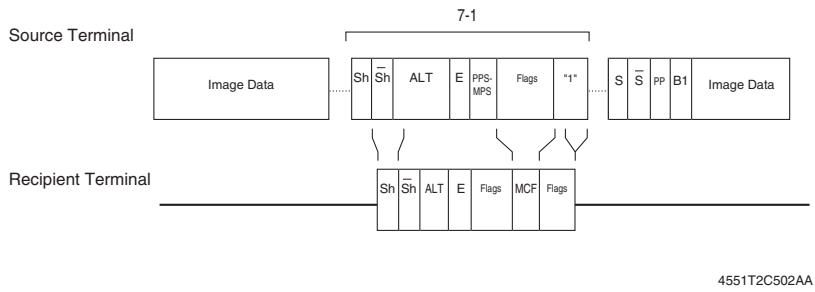
- Communication control of this system follows ITU-T (previously known as CCITT) recommended T.30 binary procedure (G3/ECM; error collection mode).
- Communication mode will be selected automatically with the type of phone line (PSTN) and the ID signal from a remote terminal.

4.1 V.34 Mode Communication Procedure

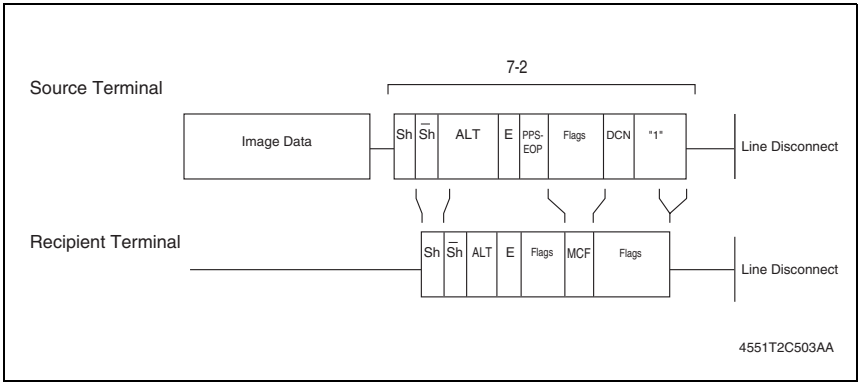
<Pre-control>



<Between pages>



<Post-control>



4.1.1 V.34 Mode Communication Procedure

- V3.4 mode does not always select the transmission speed of 36.6 Kbit/s. An optimal transmission speed will be selected according to the sequences described in the item 3 and 4 below in order to establish communication.
- Transmission speed: 2.4 to 36.6 Kbit/s (by 2.4 K step)
- Symbol rate: 6 rates (5 rates are supported)
  3429, 3200, 3000, 2800, (2743), 2400 symbol/s

1. (CNG)
   Calling tone
   A monotone signal of 1100 Hz, transmitted with the period of 0.5 sec ON and 3 sec OFF.
2. (V.8)
   Modem ID sequence
   A 300 bit/sec signal.
   This sequence exchanges information on function types and modulation methods with a remote terminal. The following sequences will be proceeded with the modulation method that both terminals have among the exchanged system information.
3. (Line probing)
   Sequence to measure line characteristics.
   This sequence measures the line characteristics by exchanging signals between two modems.
   The symbol rate will be determined by this sequence. This sequence will be one of basis for data to determine the transmission sequence.
4. (TRN)
   Equalizer training sequence
   This sequence corresponds to the conventional procedure TCF. Sending a signal with the fastest transmission speed specified by the remote terminal sets the equalizer of the modem of the receiver terminal.
5. (Control channel)
   Sequence to determine modem parameters and system parameters.
   A signal of 1200 bit/sec.
   It corresponds to the conventional procedure of phase B.

   A. A sequence for determining modem parameters
   It determines the transmission speed of the primary channel by the results of the line probing sequence and TRN (equalizer training sequence).

   B. Sequence to determine system parameters
   The same sequence as the conventional phase B procedure.
6. (Primary channel)
   Sequence for transmitting image data.
   It corresponds to the conventional phase C procedure.
7. (Control channel)
   It corresponds to the conventional phase D procedure. A signal of 1200 bit/s.
   Sequences between pages when there are multiple pages.
   Page termination sequence.

4.2 Communication Mode

4.2.1 Priority

- This system has two communication modes: ECM and G3. Communication will be established with an appropriate mode determined by the capability of the remote terminal. The priority of the communication modes is as follows:

Priority	Communication mode	Remark
1st	ECM	Followed ITU-T (Previously CCITT) recommendation (Can communicate with other company's system). Error correction by procedure signals.
2nd	G3	Followed ITU-T (Previously CCITT) recommendation (Can communicate with other company's system).

4.2.2 Communication modes of ECM/G3

- An optimal mode will be selected according to the capabilities of both terminals.

		RX (Receiver)				
		V.34/ECM	V.17/ECM	V.17/G3	V.29/ECM	V.29/G3
TX (Sender)	V.34/ECM	V.34/ECM	V.17/ECM	V.17/G3	V.29/ECM	V.29/G3
	V.17/ECM	V.17/ECM	V.17/ECM	V.17/G3	V.29/ECM	V.29/G3
	V.17/G3	V.17/G3	V.17/G3	V.17/G3	V.29/G3	V.29/G3
	V.29/ECM	V.29/ECM	V.29/ECM	V.29/G3	V.29/ECM	V.29/G3
	V.29/G3	V.29/G3	V.29/G3	V.29/G3	V.29/G3	V.29/G3

V.34: 2400 ~ 33600 bps starting mode
V.17: 14000 bps starting mode
V.29: 9600 bps starting mode

4.3 Encoding Method

- There are 4 encoding methods available to this system: JBIG, MMR, MR, MH. An optimal method will be selected according to the capabilities and image quality of both terminals.

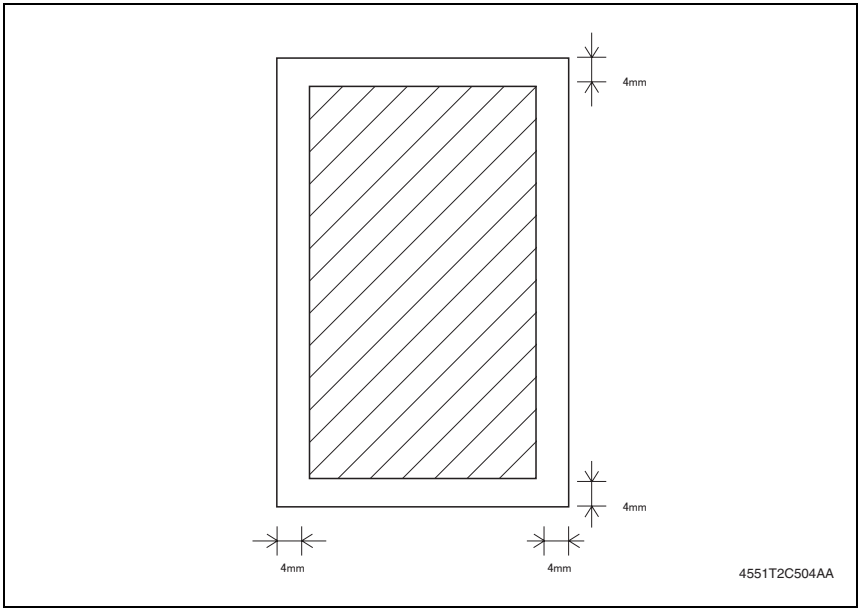
Encoding method	Binary priority	Remark
JBIG	1st	ECM
MMR	2nd	ECM
MR	3rd	G3
MH	4th	G3

NOTE
UMH/UMR are unavailable to the system.

5. Selecting Print Paper

5.1 Printing Area

- The figure below shows the printable area on the paper.
- The minimum margins are 4 mm.



5.2 Printing Mode

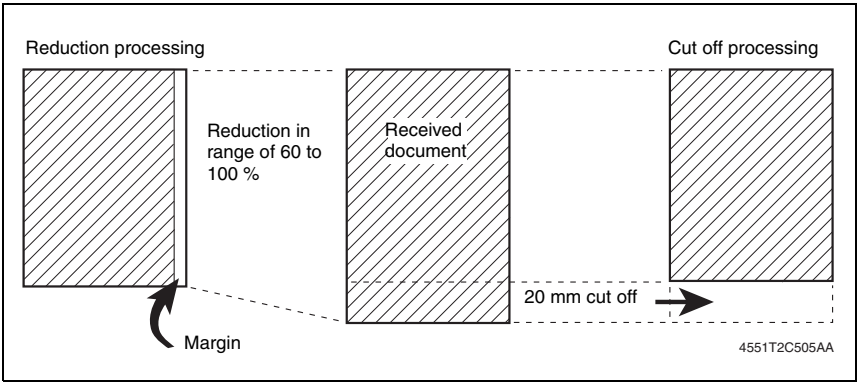
- There are 2 printing modes available to this system. The soft switch (MODE 007) toggles these modes. They are valid only for printing received documents.

5.2.1 Automatic reduction mode

- If the length of a received document exceeds the printable area, this mode cuts off the document within the cutting length specified with the soft switch (MODE 007). If the excess length is longer than the specified cutting off length, the document will be reduced within the upper limit of reducing the size specified with the soft switch (MODE 007).

5.2.2 Cut off mode

- If the length of a received document exceeds the printable area, this mode cuts off the document within the cutting length specified with the soft switch (MODE 007). (No reduction.)



5.3 Print Paper Selection Mode (FAX)

- This system has the following modes for selecting print paper. The soft switch (MODE 008) toggles these modes.
- They are valid only for printing received documents.

5.3.1 Standard mode

- This mode selects print paper to avoid document splitting as much as possible.

Example: Metric area

Available sizes of paper: A4 Lengthwise and A3 Lengthwise	
Size of received document	B4 Lengthwise
Printing mode	Automatic reduction (Upper reduction limit of 65 %)

- In this case, the system will use the A3 paper without reduction. If the A3 paper has run out, the A4 Lengthwise paper will be used with reduction.

Example: Inch area

Available sizes of paper: Letter Lengthwise and 11 x 17 Lengthwise	
Size of received document	Letter Lengthwise
Printing mode	Automatic reduction (Upper reduction limit of 60 %)

- In this case, the system will use the Letter paper without reduction. If the Letter Lengthwise paper is run out, the 11 x 17 Lengthwise paper will be used with reduction.

5.3.2 Width preference mode

- This mode selects paper whose width is the same as or smaller than a received document.

Example: Metric area

Available sizes of print paper: A4 Lengthwise and A3 Lengthwise	
Size of received document	B4 Lengthwise
Printing mode	Automatic reduction (Upper reduction limit of 60 %)

- In this case, the system will use the A3 paper with reduction. If the A3 paper has run out, the printing job will be halted and wait for new paper.

Example: Inch area

Available sizes of print paper: 11 x 17 Lengthwise	
Size of received document	Letter Lengthwise
Printing mode	Automatic reduction (Upper reduction limit of 60 %)

- In this case, the system will not print. If the Letter L paper is run out, the printing job will be halted and wait for new paper.

5.3.3 Fixed width mode

- This mode selects print paper whose width is the same as a received document.

Example: Metric area

Available sizes of print paper: A4 Lengthwise and A3 Lengthwise	
Size of received document	B4 Lengthwise
Printing mode	Automatic reduction (Upper reduction limit of 65 %)

- In this case, the system will use the B4 paper with reduction. If the B4 paper has run out, the printing job will be halted and wait for new paper.

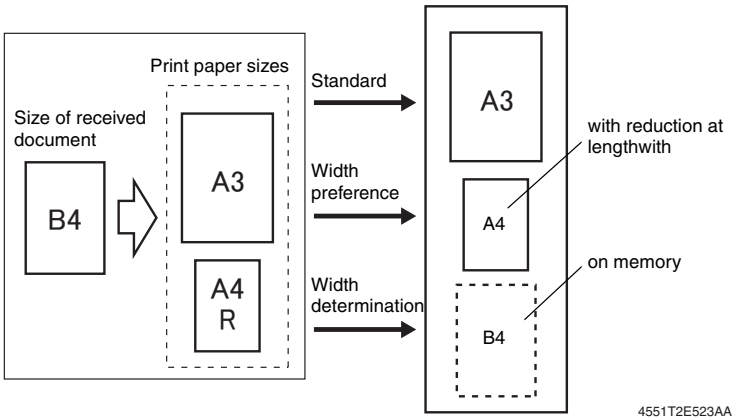
Example: Inch area

Available sizes of print paper: 11 x 17 Lengthwise	
Size of received document	Letter Lengthwise
Printing mode	Automatic reduction (Upper reduction limit of 60 %)

- In this case, the system will not print. If the Letter L paper is run out, the printing job will be halted and wait for new paper.
- The standard and the preference modes have 4 different submodes. Each of them has priorities for selection. (Users can select only submode1.)

Submode 1	Selecting a print paper whose width is the same as a received document without reduction.
Submode 2	Selecting a print paper whose width is the same as a received document with minimum margins (minimum nonprinting area).
Submode 3	Selecting a print paper to print out without reduction. (The width will not be considered.)
Submode 4	Selecting a print paper with minimum nonprinting area. (The width will not be considered.)

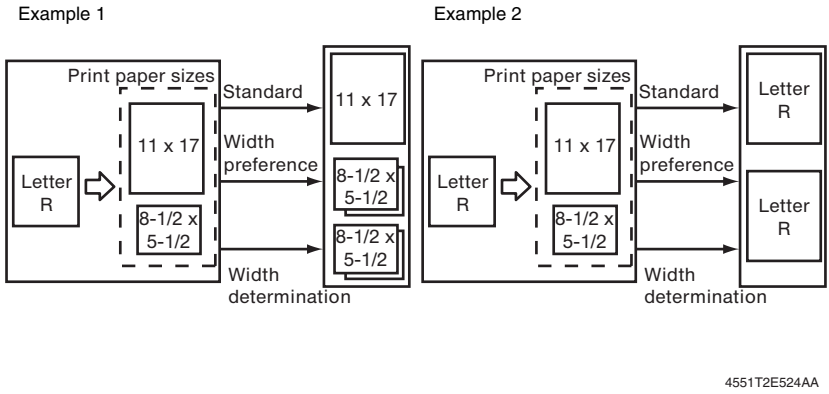
Example Metric area



The following table summarizes the effective print length for print paper which this system can use:

Print paper size	Print paper size		Effective print size		Remark
	Sub scanning length	Main scanning length	Sub scanning length	Main scanning length	
A5R	210.0	148.0	202.0	140.0	
B5	182.0	257.0	174.0	249.0	
B5R	257.0	182.0	249.0	174.0	*1
A4R	210.0	297.0	202.0	289.0	
B4R	257.0	364.0	249.0	356.0	
A4	297.0	210.0	289.0	202.0	
A3	297.0	420.0	289.0	412.0	

Example Inch area



The following table summarizes the effective print length for print paper which this system can use:

Print paper size	Print paper size		Effective print size		Remark
	Sub scanning length	Main scanning length	Sub scanning length	Main scanning length	
Letter L	215.9	279.4	207.4	271.4	
Letter C	279.4	215.9	271.4	207.9	
Legal L	215.9	355.6	207.9	347.6	
Ledger L (11" x 17")	279.4	431.8	271.4	423.8	
INVOICE L	139.7	215.9	131.7	207.9	*1
INVOICE C	215.9	139.7	207.9	131.7	*1

*1: Available only with a multi-purpose tray or manual feeding (Copy and PC print).

5.3.4 Print paper size selections (when receiving)

- This system automatically selects and prints on the most suitable print paper for the received document from the available print paper cassettes.

<Print paper selection when factory set>
Factory settings concerning print paper selection

Paper detection	: Paper priority	Longer document processing	: Reduction
Paper selection	: Standard	Reduction rate	: 65 % (Metric area) 60 % (Inch area)
2-page receiving	: Yes	Cut-off length	: 20 mm
Rolling printing	: Yes (without sorting)		

5.3.5 Paper detection <Method to declare print paper size to facsimile of other party when print paper has run out>

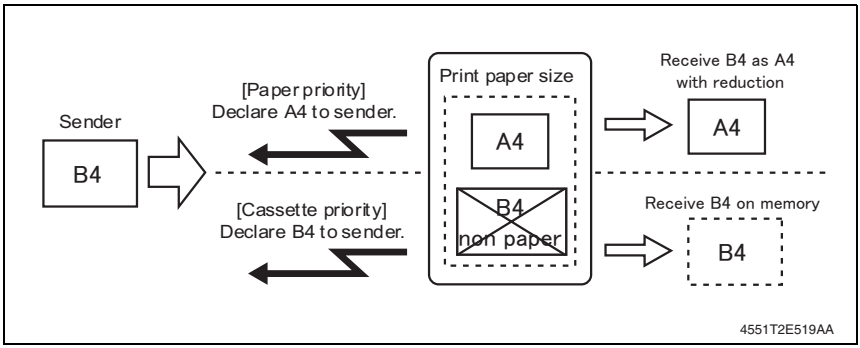
<Method to declare print paper size to facsimile of other party when print paper has run out>

A. Paper priority mode (Initial setting)

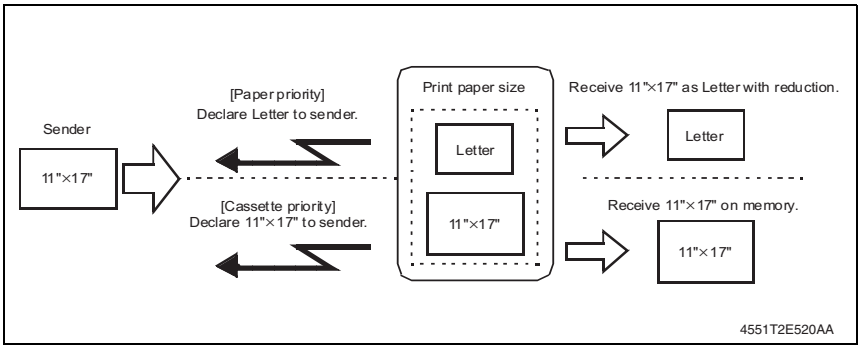
- Declare only available print paper sizes to the facsimile of other party.
- Sizes of print paper that has run out are not declared.

B. Cassette priority mode

<For Metric Areas>



<For Inch Areas>



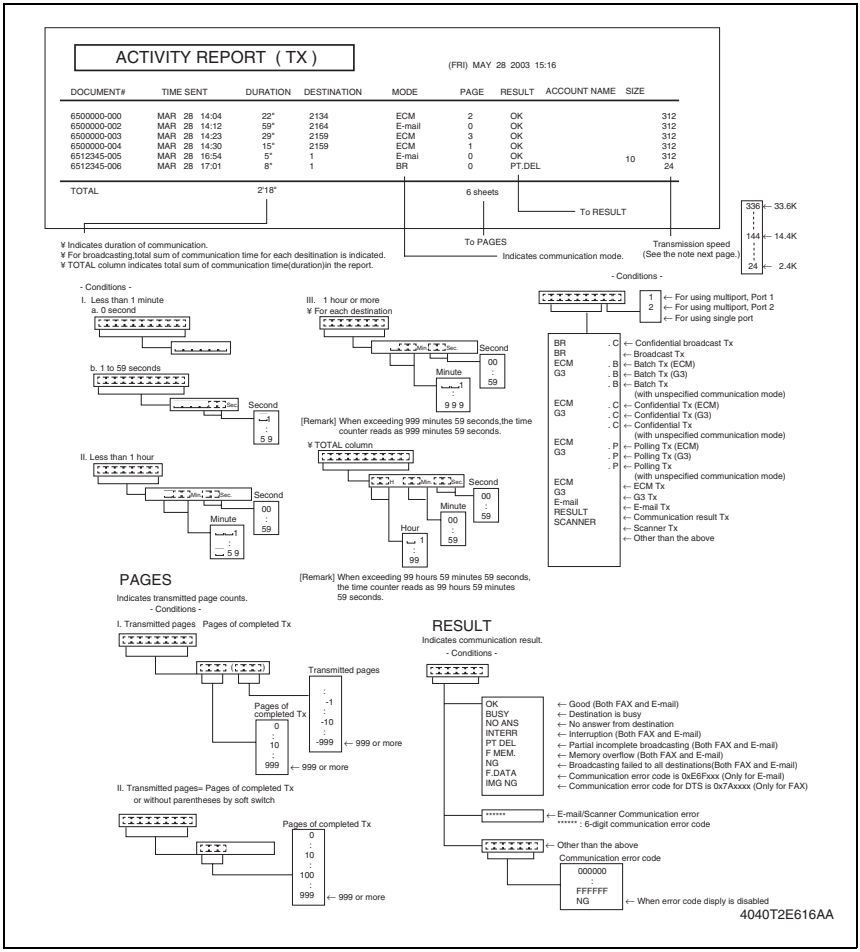
6. List of Reports

	Report name	Auto print	Manual print
Transmission management	TRANSMISSION REPORT	O	–
	SERIAL BROADCAST REPORT	O	–
	TRANSMISSION REPORT (for incompleted TX)	O	–
Statistical management	ACTIVITY REPORT (TX)	O	O
	ACTIVITY REPORT (RX)	O	O
Memory management	MEMORY CLEAR REPORT	O	–
List	ONE-TOUCH DIAL # LIST	–	O
	FAX PROGRAM LIST	–	O
	BULLETIN BOARD LIST	–	O
	SETTING LIST	–	O
	CONFIDENTIAL LIST	–	O
Maintenance	G3 PROTOCOL TRACE	–	O
	NETWORK PROTOCOL TRACE	–	O
	MEMORY DUMP	–	O
	FILE DUMP	–	O
	SERVICE CALL REPORT	O (TX)	O

NOTE

- **Setting up the soft switch (MODE 020 Bit 3) is necessary to include communication error codes in a report.**
- **Setting up the soft switch (MODE 020 Bit 7) is necessary to include the number of pages in a report.**
- **The soft switch (MODE 023 Bit 3) can specify a transmission report with or without the image merge function.**
- **Setting up the soft switch (MODE 020 Bit 5) is necessary to include the transmission speed in an Activity Report (TX/RX).**

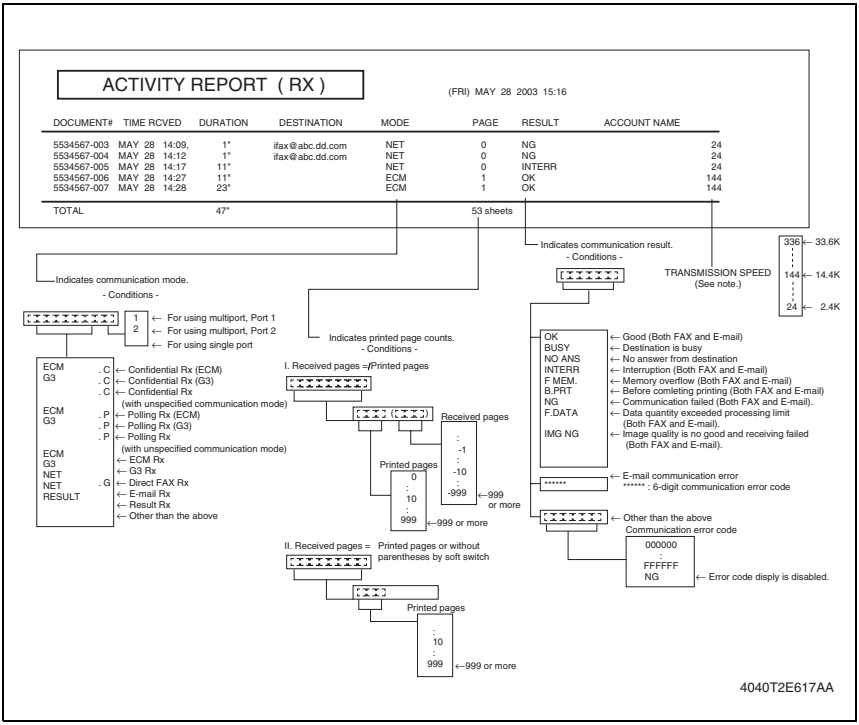
6.1 Activity Report (TX)


ACTIVITY REPORT (TX)
(FRI) MAY 28 2003 15:16
DOCUMENT# TIME SENT DURATION DESTINATION MODE PAGE RESULT ACCOUNT NAME SIZE
6500000-000 MAR 28 14:04 22" 2134 ECM 2 OK 312
6500000-002 MAR 28 14:12 59" 2164 E-mail 0 OK 312
6500000-003 MAR 28 14:23 29" 2159 ECM 3 OK 312
6500000-004 MAR 28 14:30 15" 2159 ECM 1 OK 312
6512345-005 MAR 28 16:54 5" 1 E-mai 0 OK 10 312
6512345-006 MAR 28 17:01 8" 1 BR 0 PT.DEL 24
TOTAL 2'18" 6 sheets
To RESULT
To PAGES
Indicates communication mode.
Transmission speed (See the note next page.)
336 ← 33.6K
144 ← 14.4K
24 ← 2.4K
¥ Indicates duration of communication.
¥ For broadcasting,total sum of communication time for each destination is indicated.
¥ TOTAL column indicates total sum of communication time(duration)in the report.
- Conditions -
I. Less than 1 minute
a. 0 second
b. 1 to 59 seconds
Second
II. Less than 1 hour
Minute
III. 1 hour or more
¥ For each destination
Hour
[Remark] When exceeding 999 minutes 59 seconds,the time counter reads as 999 minutes 59 seconds.
¥ TOTAL column
[Remark] When exceeding 99 hours 59 minutes 59 seconds, the time counter reads as 99 hours 59 minutes 59 seconds.
PAGES
Indicates transmitted page counts.
I. Transmitted pages Pages of completed Tx
Transmitted pages
Pages of completed Tx
← 999 or more
II. Transmitted pages= Pages of completed Tx or without parentheses by soft switch
RESULT
Indicates communication result.
OK ← Good (Both FAX and E-mail)
BUSY ← Destination is busy
NO ANS ← No answer from destination
INTERR ← Interruption (Both FAX and E-mail)
PT.DEL ← Partial incomplete broadcasting (Both FAX and E-mail)
F MEM. ← Memory overflow (Both FAX and E-mail)
NG ← Broadcasting failed to all destinations(Both FAX and E-mail)
F.DATA ← Communication error code is 0xE6Fxxx (Only for E-mail)
IMG NG ← Communication error code for DTS is 0x7Axxxx (Only for FAX)
****** ← E-mail/Scanner Communication error
****** : 6-digit communication error code
Other than the above
Communication error code
000000
FFFFFF
NG ← When error code disply is disabled
1 ← For using multiport, Port 1
2 ← For using multiport, Port 2
← For using single port
BR . C ← Confidential broadcast Tx
BR ← Broadcast Tx
ECM . B ← Batch Tx (ECM)
G3 . B ← Batch Tx (G3)
. B ← Batch Tx (with unspecified communication mode)
ECM . C ← Confidential Tx (ECM)
G3 . C ← Confidential Tx (G3)
. C ← Confidential Tx (with unspecified communication mode)
ECM . P ← Polling Tx (ECM)
G3 . P ← Polling Tx (G3)
. P ← Polling Tx (with unspecified communication mode)
ECM ← ECM Tx
G3 ← G3 Tx
E-mail ← E-mail Tx
RESULT ← Communication result Tx
SCANNER ← Scanner Tx
← Other than the above
4040T2E616AA

NOTE

- **Printing reports:**
  With automatic LOGOUT : All information on 50 communication activities will be printed.
  With manual printing : All information on the last 50 communication activities (if there are over 50 activities).
- **Communication error codes will be listed only when requested to print (MODE 020 Bit 3).**
- **"Transmission speed" on the right side requires the soft switch setting (MODE 020 Bit 5).**

6.2 Activity Report (RX)


ACTIVITY REPORT (RX)
(FRI) MAY 28 2003 15:16
DOCUMENT# TIME RCVED DURATION DESTINATION MODE PAGE RESULT ACCOUNT NAME
5534567-003 MAY 28 14:09, 1" ifax@abc.dd.com NET 0 NG 24
5534567-004 MAY 28 14:12 1" ifax@abc.dd.com NET 0 NG 24
5534567-005 MAY 28 14:17 11" NET 0 INTERR 24
5534567-006 MAY 28 14:27 11" ECM 1 OK 144
5534567-007 MAY 28 14:28 23" ECM 1 OK 144
TOTAL 47" 53 sheets
Indicates communication mode.
- Conditions -
1 ← For using multiport, Port 1
2 ← For using multiport, Port 2
← For using single port
ECM . C ← Confidential Rx (ECM)
G3 . C ← Confidential Rx (G3)
. C ← Confidential Rx
(with unspecified communication mode)
ECM . P ← Polling Rx (ECM)
G3 . P ← Polling Rx (G3)
. P ← Polling Rx
(with unspecified communication mode)
ECM ← ECM Rx
G3 ← G3 Rx
NET ← Direct FAX Rx
NET . G ← E-mail Rx
RESULT ← Result Rx
← Other than the above
Indicates printed page counts.
- Conditions -
I. Received pages =/Printed pages
Received pages
Printed pages
0
10
999
←999 or more
: -1 : -10 : -999 ←999 or more
II. Received pages = Printed pages or without parentheses by soft switch
Printed pages
10
999
←999 or more
Indicates communication result.
- Conditions -
OK ← Good (Both FAX and E-mail)
BUSY ← Destination is busy
NO ANS ← No answer from destination
INTERR ← Interruption (Both FAX and E-mail)
F MEM. ← Memory overflow (Both FAX and E-mail)
B.PRT ← Before comleting printing (Both FAX and E-mail)
NG ← Communication failed (Both FAX and E-mail).
F.DATA ← Data quantity exceeded processing limit (Both FAX and E-mail).
IMG NG ← Image quality is no good and receiving failed (Both FAX and E-mail).
****** ← E-mail communication error
****** : 6-digit communication error code
← Other than the above
Communication error code
000000 : FFFFFF NG ← Error code disply is disabled.
TRANSMISSION SPEED (See note.)
336 ← 33.6K
144 ← 14.4K
24 ← 2.4K
4040T2E617AA

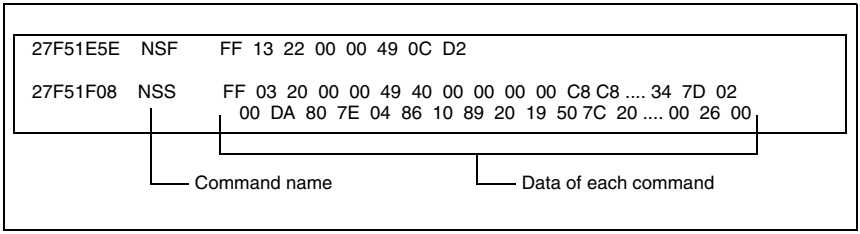
NOTE

- **Specify FCF names with capital letters for signals at 300 bps, otherwise use small letters.**
- **If the information of a single frame is longer than a single line, the next line will also be used. This will be repeated as necessary.**
- **If there is no FCF name corresponds to the data in the FCF field, "?" will be displayed in the FCF name field.**
- **If the information cannot be printed in a single sheet of a specified paper, the excess information will be printed on the next paper.**

6.3 Protocol Trace

- Each communication processes information on a protocol trace.
- If you wish to print it, go to the maintenance mode to press <Utility>.

6.3.1 G3 Protocol Trace



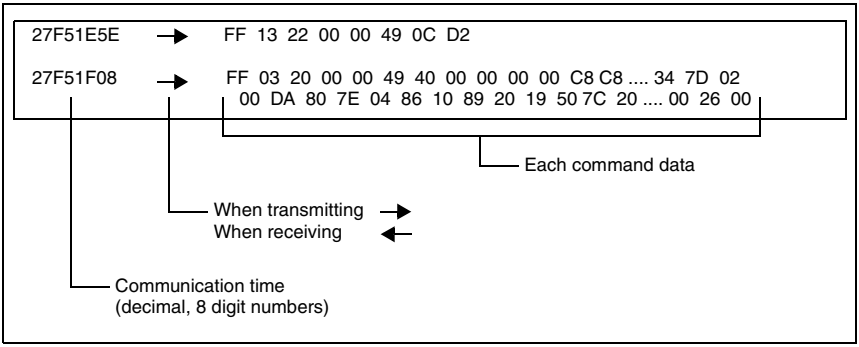
NOTE

- **Specify FCF names with capital letters for signals at 300 bps, otherwise use small letters.**
- **If the information of a single frame is longer than a single line, the next line will also be used. This will be repeated as necessary.**
- **If there is no FCF name corresponds to the data in the FCF field, "?" will be displayed in the FCF name field.**
- **If the information cannot be printed in a single sheet of a specified paper, the excess information will be printed on the next paper.**

A. Print by manual

1. Press the "Utility / Counter" key.
2. Press the "Check Detail" key.
3. Press the following keys in this order:
   Stop → 0 → 0 → Stop → 0 → 2
4. Press the "Maintenance Mode" key.
5. Enter the 8-digit service code and touch [END]. (Default value: 00000000)
6. Press the "Protocol Trace" key.

6.4 Network Protocol Trace

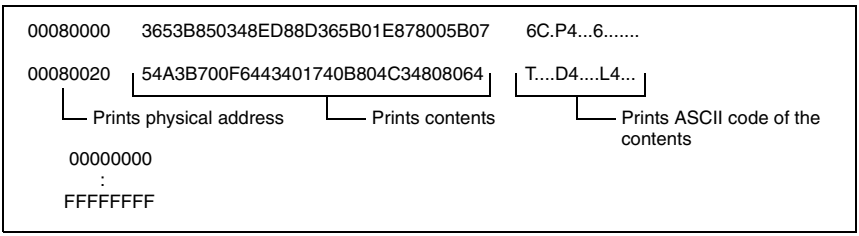

27F51E5E → FF 13 22 00 00 49 0C D2
27F51F08 → FF 03 20 00 00 49 40 00 00 00 00 C8 C8 .... 34 7D 02
00 DA 80 7E 04 86 10 89 20 19 50 7C 20 .... 00 26 00
Each command data
When transmitting →
When receiving ←
Communication time
(decimal, 8 digit numbers)

NOTE

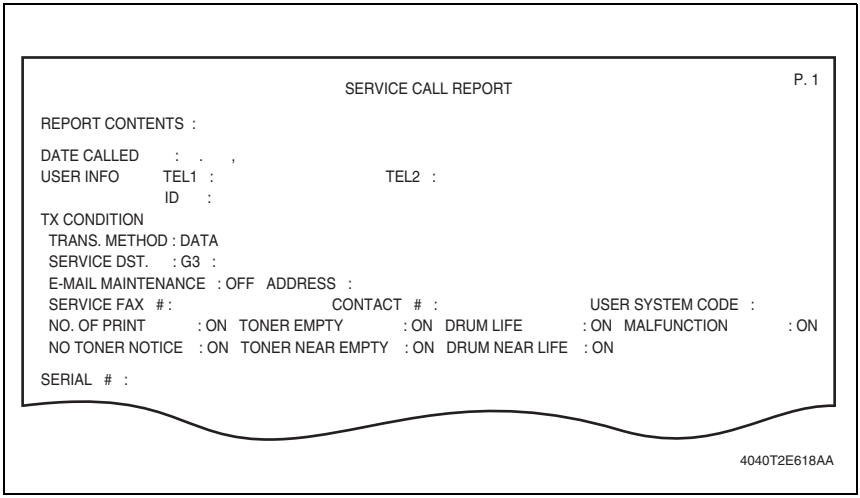
- **Protocol character strings are configured with all ASCII codes (0x20 to 0x7E). The protocol character strings are up to 84 digits per line. When there are protocol character strings of 85 digits or more, it returns to the next line after 84 characters are displayed. However, in this instance, the next line is displayed after 8+3+1+1=13 spaces are opened. It also returns in similar fashion when it exceeds 2 lines. The length of the protocol character string then becomes 1 to 998 characters.**
- **The lines where the report is displayed becomes as shown below in relation to paper size.**
  Letter size : 125 lines (including margin lines)
  INVOICE size : 58 lines (including margin lines)
- **The space has no instance where protocol character strings are returned. 1 line (2 mm) is opened when outside that instance.**

6.5 Memory Dump & File Dump

- Memory dump and file dump have the same format.



6.6 Service Call Report



SERVICE CALL REPORT P. 1

REPORT CONTENTS :

DATE CALLED : . ,
USER INFO TEL1 : TEL2 :
ID :
TX CONDITION
TRANS. METHOD : DATA
SERVICE DST. : G3 :
E-MAIL MAINTENANCE : OFF ADDRESS :
SERVICE FAX # : CONTACT # : USER SYSTEM CODE :
NO. OF PRINT : ON TONER EMPTY : ON DRUM LIFE : ON MALFUNCTION : ON
NO TONER NOTICE : ON TONER NEAR EMPTY : ON DRUM NEAR LIFE : ON

SERIAL # :

4040T2E618AA

6.6.1 Content

- You can output the service call report to your terminal manually. The service call report will be transmitted to the Service Center automatically with a specified alarm.
- When this report is transmitted, it always includes “TSI” (even if this function is disabled).

A. REPORT CONTENTS

- This report has the reason for transmission and the date of transmission.

<Details>

• # OF PRINT	• DRUM LIFE
• PRT MALFUNCTION	• TONER NEAR LIFE (Status C) 5 K
• PRT OPTION MALFUNCTION	• TONER NEAR LIFE (Status C) 10 K
• SCANNER OPTION MALFUNCTION	• DRUM NEAR LIFE (Status D)
• NO TONER NOTICE	• DATE CALLED
• TONER EMPTY	

B. USER AND TERMINAL INFORMATION

- This report has various information on users and terminals of your facsimile system.

(1) Phone number

<Details>

• USER INFO TEL1	• USER INFO TEL2
• ID	

(2) Dialing conditions for service call report are printed.

<Details>

• TRANS. METHED (DATA/REPORT/MAIL)	• CALL #
• E-MAIL MAINTENANCE - Not used	• ADDRESS
• FAX DEST. #	• INFO CALL. #
• USER SYSTEM CODE	• # OF PRINT
• PRT MALFUNCTION	• PRT OPTION MALFUNCTION
• SCANNER OPTION MALFUNCTION	• NO TONER NOTICE
• TONER EMPTY	• DRUM LIFE
• TONER NEAR LIFE (Status C)	• DRUM NEAR LIFE (Status D)

(3) SERIAL#

<Detail>

• SERIAL#

(4) ROM REV

<Details>

• MAIN (MSC)	• PRINTER
• ADF	• LCT
• FINISHER	

(5) INSTALL DATE

(6) MAINTENANCE DATE

(7) MACHINE CONFIGURATION

<Details>

• MEMORY (0 MB or 32 MB or 64 MB or 128 MB)	• PC PRT (ON or OFF)
• PRINTER TYPE (PCL or PS)	• FAX (ON or OFF) -Always ON
• PORT (SINGL or MULTI)	• EL BOARD (ON or OFF) -Always OFF
• SCANNER OPTION (ON or OFF)	• ADF (ON or OFF) -Always ON
• ADF (ON or OFF) -Always ON	• PRT SPD
• 2 SIDED (ON or OFF)	• OPTION TRAY
• B-FN (ON or OFF)	• SADDLE (ON or OFF)
• MAILFINISHER (ON or OFF)	• 3RD TRAY (ON or OFF)
• PUNCH (ON or OFF)	• JOB SEP. (ON or OFF)
• KEY COUNTER (ON or OFF)	• COPY COUNTER (ON or OFF)
• ORG-SIZE OPT. (ON or OFF)	• HDD (ON or OFF)
• ENCRYPTIONKIT (ON or OFF)	• CASSETTE 1 to 4 (Each paper size)

(8) VARIOUS SETTING

<Details>

• AUTO PPR MD (INCH/MM or MM)	• PRI FLS (F=330 mm C=203 mm or F=330 mm C=210 mm or F=330 mm C=216 mm or F=330 mm C=220 mm)
• DRY KEY SET (Scanner or Scanner/Drum or Disable)	• 1SIDED / 2SIDED (1SIDED/2SIDED or 2SIDED ONLY)
• FUNCTION LIMIT (ON or OFF)	• LCT PAPER SIZE (A4 or LETTER)
• ZOOM (LGL → LTR)	• ZOOM (11 x 15 → LTR)
• ZOOM (11 x 17 → LTR)	• ZOOM (x0.5)
• ZOOM (LGL → 11 x 17)	• ZOOM (LTR → 11 x 17)
• ZOOM (51/2 x 81/2 → LGL)	• ZOOM (x2.0)
• ZOOM (x1.0)	• TOTAL COUNTER (MODE1 or MODE2 or MODE3)
• SIZE COUNTER (DISABLE or A3/11 x 17 or A3/B4/11 x 17/Legal or A3/B4/FLS/11 x 17/11 x 14/Legal or A6)	• COPY KIT COUNTER (MODE1 or MODE2 or MODE3)
• KEY COUNTER (ON or OFF)	• VENDER MODE (KEY COUNTER or COPY VENDER or CARD KEEPER)

C. Counter information (COUNTER INFO)

<Details>

Counter Type		Count Timing			Counting Method
		Paper Feed	Paper Ejec	Others	
TOTAL COUNTER / DEVICE COUNTER	TOTAL		○		The total number of printed pages (large size (A3) paper is counted two)
	LARGE SIZE TOTAL		○		The number of printed pages produced on large size (A3) paper
	2SIDED TOTAL		○		The number of 2-sided printed pages
	ORIGINAL TOTAL		○		
	PRINT TOTAL		○		
	COPY TOTAL		○		The total number of copies made
	COPY LARGE SIZE		○		The number of copies made on large size (A3) paper
	PCPR TOTAL		○		The total number of computer printed pages
	PCPR LARGE SIZE		○		The number of computer printed pages produced on large size (A3) paper
	FAX SCAN TOTAL				The number of original pages scanned for fax and scanner transmission
	FAX L SIZE SCAN				The number of original pages of large size (A3) paper, scanned for fax and scanner transmission
	FAX PRINT TOTAL		○		The number of printed pages for fax reception and journal output
	FAX L SIZE PRINT		○		The number of printed pages of large size (A3) paper for fax reception and journal output
	FAX TX TOTAL		○		The total number of fax transmission sessions
	FAX RX TOTAL		○		The total number of fax reception sessions
	COPY PRINT		○		
	PC PRINT		○		
	FAX PRINT		○		The number of printed pages received by fax
	REPORT PRINT		○		The number of printed pages produced as journal
	FAX TX				The number of pages transmitted by fax
	MAIL TX				The number of pages transmitted by mail
	FAX TX ERROR				The number of errors occurred during fax transmission
	FAX RX ERROR				The number of errors occurred during fax reception

Counter Type		Count Timing			Counting Method
		Paper Feed	Paper Ejec	Others	
PAPER COUNTER	Per Paper size		○		The number of used sheets
	Per Special paper setting		○		The number of used sheets
SERVICE CALL COUNTER				The number of incidents	The number of trouble occurrence
JAM COUNTER	MCBJ System			Average	Average number of copied sheets per paper jam occurrence (including finisher jam)
	MCBJ Mech. Only			Average	Average number of copied sheets per paper jam occurrence (excluding finisher jam)
	Others			Jam	The number of jam occurrence for each part
SPECIAL PARTS COUNTER/ MAINTENANCE COUNTER	DC LIFE			Ratio to life	Ratio of PC Drum running distance to the life value indicated by %
	FUSING UNIT		○		The number of paper ejection
	1ST to 4TH, Bypass Tray	○			The number of paper feed
	Toner #			Converted number of sheets	The number of sheets converted into the number of black dots in an A4 size paper with 5% black dotted documents

D. Adjustment information (ADJUST)

(1) Scanner

<Details>

• BK-S M-SCAN % (COPY)	• BK-S S-SCAN % (COPY)
• BK-S M-SCAN % (FAX)	• BK-S S-SCAN % (FAX)
• ADF FEED (CD)	• ADF FEED (FD) (F)
• ADF FEED (FD) (B)	• BK-S M-SCAN REG.
• BK-S S-SCAN REG.	• ADF REGIST.LOOP 1SIDED
• ADF REGIST.LOOP 2SIDED	• ADF ZOOM (CD) (COPY)
• ADF ZOOM (FD) (COPY)	• ADF ZOOM (CD) (FAX)
• ADF ZOOM (FD) (FAX)	

(2) Printer

<Details>

• EDGE ERASE LEAD	• EDGE ERASE TRAIL
• EDGE ERASE (R/L)	• TRAIL ERASE (DUP)
• LOOP ADJ. (1ST)	• LOOP ADJ. (2ND)
• LOOP ADJ. (3RD)	• LOOP ADJ. (4TH/LCT)
• LOOP ADJ. (DUP)	• LOOP ADJ. (BYPASS)
• REGIST. (CD) 1ST	• REGIST. (CD) 2ND
• REGIST. (CD) 3RD	• REGIST. (CD) 4TH
• REGIST. (CD) LCT	• REGIST. (CD) BYPASS
• REGIST. (CD) DUP	• REGIST. (FD)
• ID	• ATDC SENSOR GAIN
• GRID VOLTAGE ADJ.	• PUNCH-LOOP
• PUNCH-STOP	• FUSER TEMP

E. Error LOG information

(1) History of system malfunctions (MALFUNCTION HISTORY)

- This report contains and prints the last 10 incidents. When the number of incidents exceeds 10, the oldest one will be deleted.

• Date and time of malfunctions	• Malfunction codes

(2) History of FAX communication errors (FAX.COM. ERROR)

- This report contains and prints the last 10 incidents. When the number of incidents exceeds 10, the oldest one will be deleted.

• Date and time of malfunctions	• Communication error codes

(3) History of E-mail communication errors (E-MAIL COM. ERROR)

- This report contains and prints the last 10 incidents. When the number of incidents exceeds 10, the oldest one will be deleted.

• Date and time of malfunctions	• Communication error codes

(4) Information on soft switches

- This report has information on the soft switches of the main unit (1000 bytes).

KONICA MINOLTA

SERVICE MANUAL THEORY OF OPERATION

Duplex Unit/ Switchback Unit

2005.08
KONICA MINOLTA BUSINESS TECHNOLOGIES, INC. Ver. 1.0

Revision history

After publication of this service manual, the parts and mechanism may be subject to change for improvement of their performance.
Therefore, the descriptions given in this service manual may not coincide with the actual machine.

When any change has been made to the descriptions in the service manual, a revised version will be issued with a revision mark added as required.

Revision mark:

- To indicate clearly a section revised, show to the left of the revised section.
  A number within represents the number of times the revision has been made.

- To indicate clearly a section revised, show in the lower outside section of the corresponding page.
  A number within represents the number of times the revision has been made.

NOTE

Revision marks shown in a page are restricted only to the latest ones with the old ones deleted.

- When a page revised in Ver. 2.0 has been changed in Ver. 3.0:
  The revision marks for Ver. 3.0 only are shown with those for Ver. 2.0 deleted.
- When a page revised in Ver. 2.0 has not been changed in Ver. 3.0:
  The revision marks for Ver. 2.0 are left as they are.

2005/08	1.0	—	Issue of the first edition
Date	Service manual Ver.	Revision mark	Descriptions of revision

CONTENTS

Duplex Unit / Switchback Unit

Outline

1. System configuration 1
2. Paper Feed Path 2

Composition/Operation

3. Composition 3
4. Drive 4
4.1 Switchback Drive 4
4.2 Transport/Duplex Paper Feed Drive 4
5. Operation 5
5.1 Paper Transport Path Switching Mechanism 5
5.1.1 Transport path switching operation 5
5.2 Switchback mechanism 6
5.2.1 Switchback operation 6
5.2.2 Switchback Motor Control 7
5.3 Transport Control 8
5.3.1 2-sided printing method 8

Blank Page

Outline

1. System configuration

A. Type

(1) Duplex Unit

Name	Duplex Unit
Type	Switchback and Circulating Duplex Unit
Installation	Mounted on the right side door of main unit
Document Alignment	Center

B. Paper type

(1) Duplex Unit

Paper Type	Plain paper	56 g/m^2 to 90 g/m^2 (15 to 24 lb)
Paper Size	A5R to A3, 5.5 × 8.5R to 12.25 × 18	

C. Machine specifications

(1) Duplex Unit

Power Requirements	DC 24 V ± 10 % (supplied from the main unit)
	DC 5 V ± 5 % (supplied from the main unit)
Dimensions *1	89 mm (W) x 419 mm (D) x 358 mm (H) 3.5 inch (W) x 16.5 inch (D) x 14 inch (H)
Weight *1	Approx. 2.2 kg (4.75 lb)

*1: Values given only for reference when the Duplex Unit is demounted from the machine, since it is standard on the machine

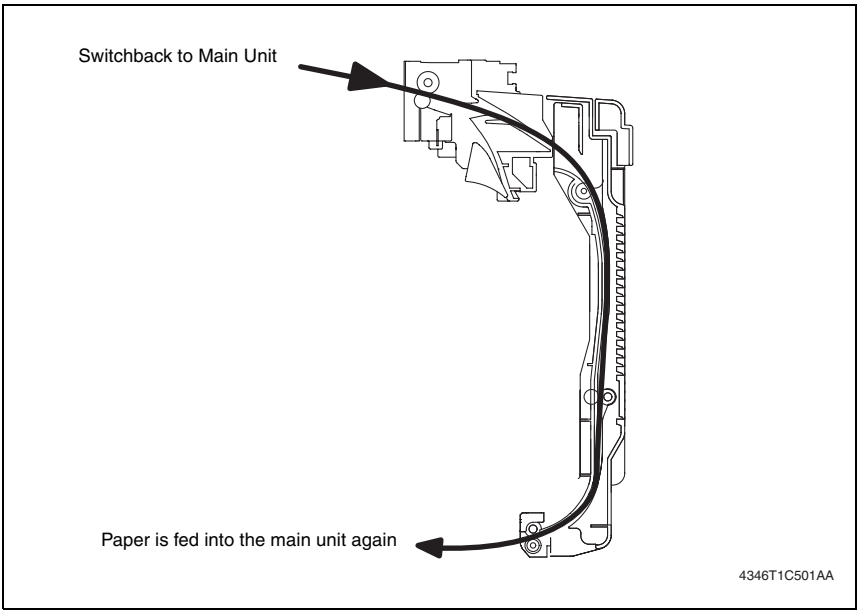
D. Operating environment

- Conforms to the operating environment of the main unit.

NOTE

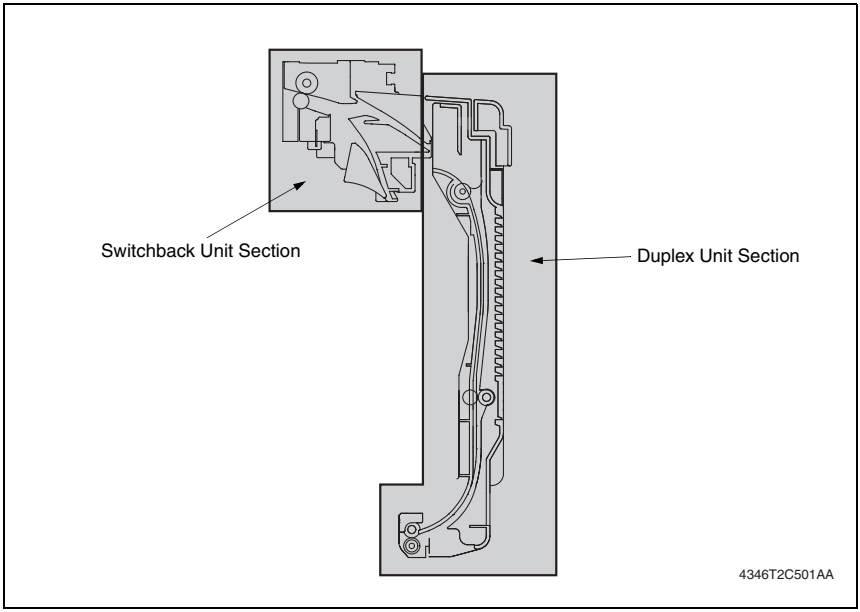
- **These specifications are subject to change without notice.**

2. Paper Feed Path



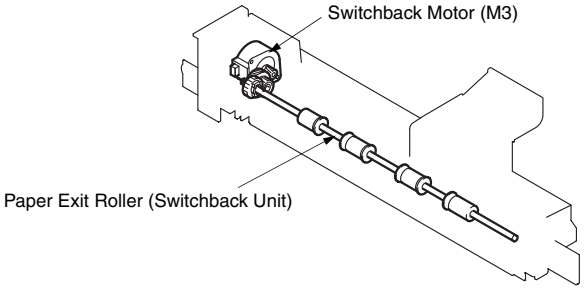
Composition/Operation

3. Composition



4. Drive

4.1 Switchback Drive



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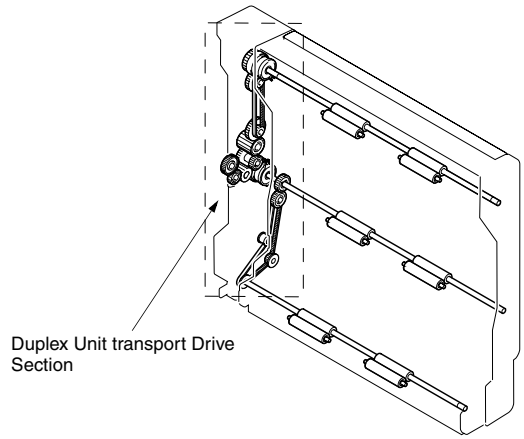
4.2 Transport/Duplex Paper Feed Drive



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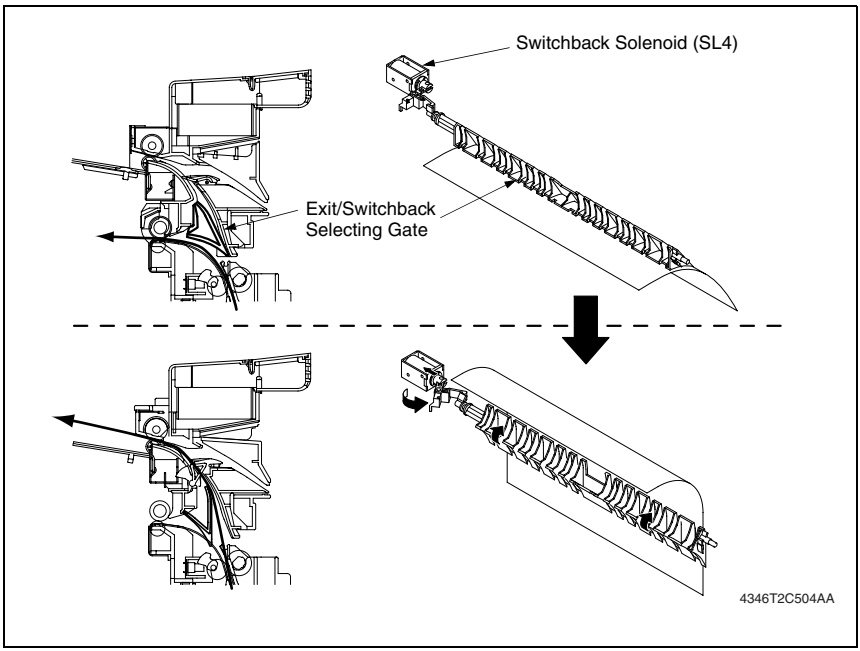
5. Operation

5.1 Paper Transport Path Switching Mechanism

5.1.1 Transport path switching operation

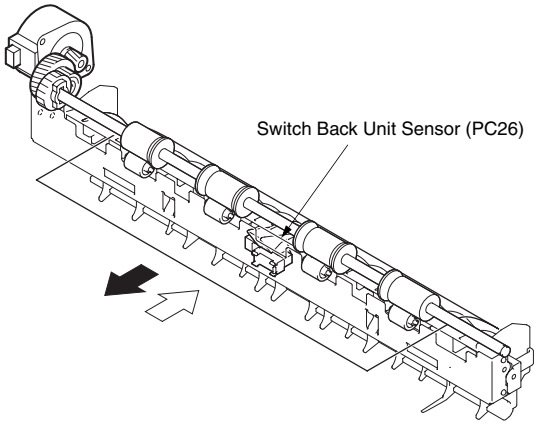
- The Switchback Solenoid of the Switchback Unit drives the Exit/Switchback Selecting Gate to select the paper path either toward the exit section or the switchback section.
- The Switchback Motor turns forward to feed the paper toward the switchback section.



5.2 Switchback mechanism

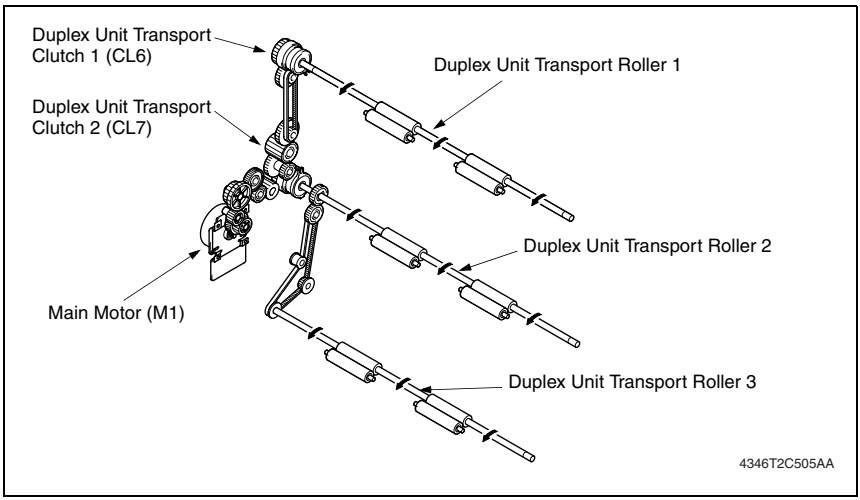
5.2.1 Switchback operation

- The Switchback Unit Sensor is deactivated as the trailing edge of the paper moves past it. After a given period of time, the paper is brought to a temporary stop. As the Switchback Motor turns backward, the paper undergoes a switchback operation and is fed to the Duplex Unit with its trailing edge first.



5.2.2 Switchback Motor Control

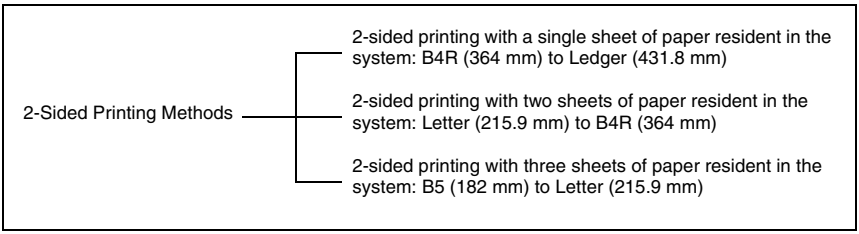
- The Duplex Unit is driven through the Duplex Unit Transport Clutches from the Main Motor.
- When Duplex Unit Transport Clutch 1 (CL6) is energized, Duplex Unit Transport Roller 1 is driven. When Duplex Unit Transport Clutch 2 (CL7) is energized, Duplex Unit Transport Roller 2 and Duplex Unit Transport Roller 3 are driven.


Duplex Unit Transport Clutch 1 (CL6)
Duplex Unit Transport Clutch 2 (CL7)
Duplex Unit Transport Roller 1
Duplex Unit Transport Roller 2
Main Motor (M1)
Duplex Unit Transport Roller 3
4346T2C505AA

5.3 Transport Control

5.3.1 2-sided printing method

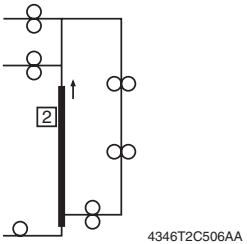
- The following two types of 2-sided printing methods are available.


2-Sided Printing Methods
2-sided printing with a single sheet of paper resident in the system: B4R (364 mm) to Ledger (431.8 mm)
2-sided printing with two sheets of paper resident in the system: Letter (215.9 mm) to B4R (364 mm)
2-sided printing with three sheets of paper resident in the system: B5 (182 mm) to Letter (215.9 mm)

A. Operations in 2-sided printing with a single sheet of paper resident in the system

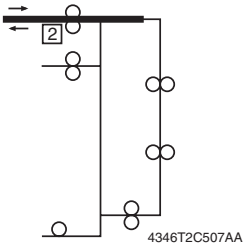
Operation 1

- The first sheet of paper is taken up and fed in from the main unit drawer and the main unit starts the first print cycle to produce the print image of the second page of the original.



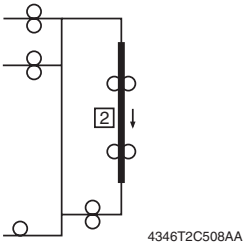
Operation 2

- The 1-sided print is transported to the Switchback Unit.
- Immediately before the 1-sided print is fed out by the Exit Roller of the Switchback Unit, the direction of rotation of the Exit Roller is reversed and the 1-sided print is transported toward and into the Duplex Unit.



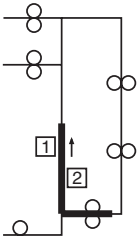
Operation 3

- The 1-sided print moves through the Duplex Unit and is directly subject to the second print cycle without being stopped.



Operation 4

- The main unit carries out the second print cycle to produce the print image of the first page of the original on the other side of the 1-sided print.



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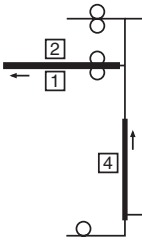
Operation 5

- The first 2-sided print is transported to the exit section of the main unit.
- While the first 2-sided print is fed out of the main unit, the image of the fourth page of the original is printed on the second sheet of paper.



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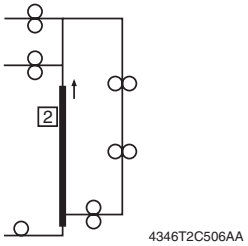
- Steps 2 through 5 are repeated.

B. Operations in 2-sided printing with two sheets of paper resident in the system

Operation 1

- The first sheet of paper is taken up and fed in from the main unit drawer and the main unit starts the first print cycle to produce the print image of the second page of the original.



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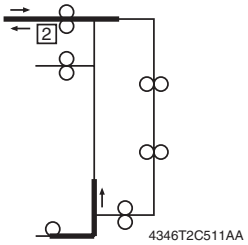
Operation 2

- The 1-sided print is transported to the Switchback Unit.
- Immediately before the 1-sided print is fed out by the Exit Roller of the Switchback Unit, the direction of rotation of the Exit Roller is reversed and the 1-sided print is transported toward and into the Duplex Unit.
- At the same time that the 1-sided print is transported, the second sheet of paper is taken up and fed into the main unit.



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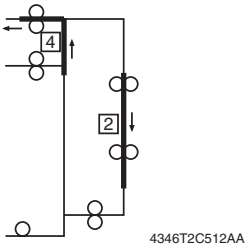
Operation 3

- The main unit carries out the first print cycle for the second sheet of paper to produce the print image of the fourth page of the original.
- At the same time, the first 1-sided print is transported through the Duplex Unit.



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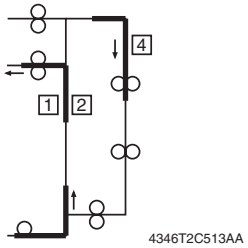
Operation 4

- The main unit produces the print image of the first page of the original on the first 1-sided print.
- At the same time that the image of the first page of the original is printed, the third sheet of paper is taken up and fed into the main unit.
- The second 1-sided print is transported toward and into the Duplex Unit.



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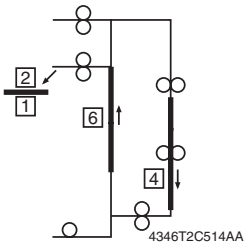
Operation 5

- While feeding the first 2-sided print out, main unit produces the print image of the 6th page of the original on the third sheet of paper.
- The second 1-sided print remains in the standby state before the Duplex Unit Transport Roller until the next paper motion is carried out.



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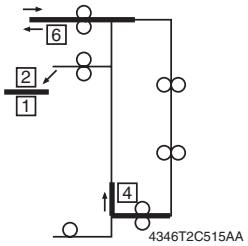
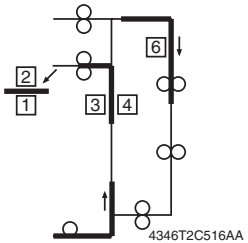
Operation 6

- The third 1-sided print is transported to the Switchback Unit.
- Immediately before the third 1-sided print is fed out by the Exit Roller of the Switchback Unit, the direction of rotation of the Exit Roller is reversed and the third 1-sided print is transported toward and into the Duplex Unit.
- At the same time that the third 1-sided print is transported, the second 1-sided print that has stood by in the Duplex Unit for the subsequent paper motion is transported into the main unit.



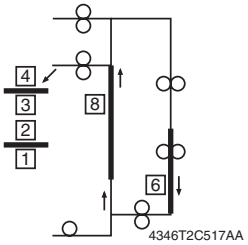
Operation 7

- The main unit carries out the first print cycle for the second sheet of paper to produce the print image of the third page of the original.
- At the same time, the first 1-sided print for the third is transported through the Duplex Unit.
- At the same time, the forth sheet of paper is taken up and fed into the main unit.



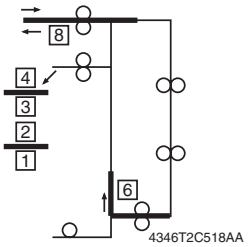
Operation 8

- While feeding the second 2-sided print out, main unit produces the print image of the 8th page of the original on the fourth sheet of paper.
- The third 1-sided print remains in the standby state before the Duplex Unit Transport Roller until the next paper motion is carried out.



Operation 9

- The fourth 1-sided print is transported to the Switchback Unit.
- Immediately before the fourth 1-sided print is fed out by the Exit Roller of the Switchback Unit, the direction of rotation of the Exit Roller is reversed and the fourth 1-sided print is transported toward and into the Duplex Unit.
- At the same time that the fourth 1-sided print is transported, the third 1-sided print that has stood by in the Duplex Unit for the subsequent paper motion is transported into the main unit.

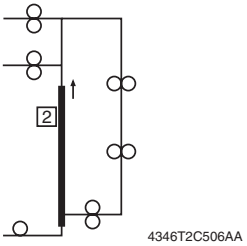


- Steps 7 through 9 are repeated.

C. Operations in 2-sided printing with three sheets of paper resident in the system

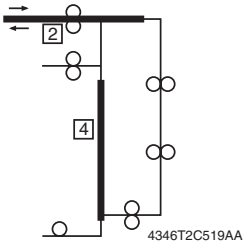
Operation 1

- The first sheet of paper is taken up and fed in from the main unit drawer and the main unit starts the first print cycle to produce the print image of the second page of the original.



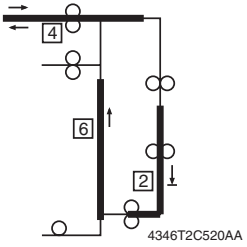
Operation 2

- The 1-sided print is transported to the Switchback Unit.
- Immediately before the 1-sided print is fed out by the Exit Roller of the Switchback Unit, the direction of rotation of the Exit Roller is reversed and the 1-sided print is transported toward and into the Duplex Unit.
- At the same time that the 1-sided print is transported, the second sheet of paper is taken up and fed into the main unit and a print cycle is carried out to produce the print image of the fourth page of the original on the second sheet of paper.



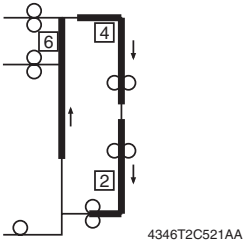
Operation 3

- The first 1-sided print is transported into the Duplex Unit and remains in the standby state before the Duplex Unit Transport Roller until the main unit starts a paper take-up and feed sequence for the third sheet of paper.
- The second 1-sided print is transported to the Switchback Unit.
- Immediately before the second 1-sided print is fed out by the Exit Roller of the Switchback Unit, the direction of rotation of the Exit Roller is reversed and the second 1-sided print is transported toward and into the Duplex Unit.
- At the same time that the second 1-sided print is transported, the third sheet of paper is taken up and fed into the main unit and a print cycle is carried out to produce the print image of the sixth page of the original on the third sheet of paper.



Operation 4

- The third 1-sided print is transported to the Switchback Unit.
- At the same time that the third 1-sided print is transported, the first 1-sided print that has stood by in the Duplex Unit for the subsequent paper motion is transported into the main unit.
- The second 1-sided print is transported toward and into the Duplex Unit.



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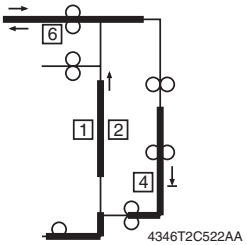
Operation 5

- A print cycle is carried to produce the print image of the first page of the original on the first 1-sided print.
- At the same time, the third 1-sided print is transported toward and into the Duplex Unit.
- The second 1-sided print remains in the standby state before the Duplex Unit Transport Roller until the next paper motion is carried out.
- At the same time, the main unit starts a paper take-up and feed sequence for the fourth sheet of paper.



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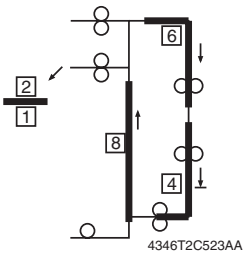
Operation 6

- While feeding the first 2-sided print out of itself, the main unit carries out a print cycle for producing a print image of the eighth page of the original on the fourth sheet of paper.
- The second 1-sided print stands by before the Duplex Unit Transport Roller.
- The third 1-sided print stops temporarily when there is a predetermined spacing or less away from the second 1-sided print.



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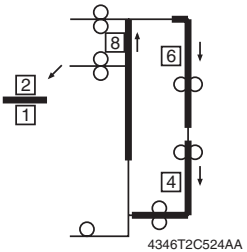
Operation 7

- The fourth 1-sided print is transported to the Switchback Unit.
- At the same time that the fourth 1-sided print is transported, the second 1-sided print that has stood by in the Duplex Unit for the subsequent paper motion is transported into the main unit.
- At the same time that the second 1-sided print is transported, the third 1-sided print remains in the standby state before the Duplex Unit Transport Roller until the next paper motion is carried out.



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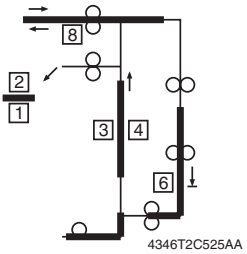
Operation 8

- A print cycle is carried out to produce a print image of the third page of the original to the second 1-sided print.
- At the same time, the fourth 1-sided print is transported toward and into the Duplex Unit.
- The third 1-sided print remains in the standby state before the Duplex Unit Transport Roller until the next paper motion is carried out.
- At the same time, the main unit starts a paper take-up and feed sequence for the fifth sheet of paper.



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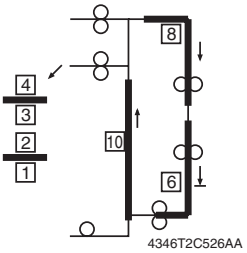
Operation 9

- While feeding the second 2-sided print out of itself, the main unit carries out a print cycle for producing a print image of the tenth page of the original on the fifth sheet of paper.
- The third 1-sided print stands by before the Duplex Unit Transport Roller.
- The fourth 1-sided print stops temporarily when there is a predetermined spacing or less away from the second 2-sided print.



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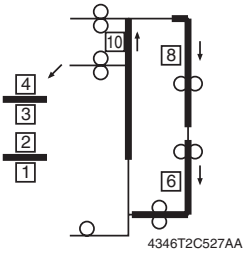
Operation 10

- The fifth 1-sided print is transported to the Switchback Unit.
- At the same time that the fifth 1-sided print is transported, the third 1-sided print that has stood by in the Duplex Unit for the subsequent paper motion is transported into the main unit.
- At the same time that the third 1-sided print is transported, the fourth 1-sided print remains in the standby state before the Duplex Unit Transport Roller until the next paper motion is carried out.



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- Steps 8 through 10 are repeated.

KONICA MINOLTA

SERVICE MANUAL

THEORY OF OPERATION

DF-605

2005.08
KONICA MINOLTA BUSINESS TECHNOLOGIES, INC. Ver. 1.0

Revision history

After publication of this service manual, the parts and mechanism may be subject to change for improvement of their performance.
Therefore, the descriptions given in this service manual may not coincide with the actual machine.

When any change has been made to the descriptions in the service manual, a revised version will be issued with a revision mark added as required.

Revision mark:

- To indicate clearly a section revised, show to the left of the revised section.
  A number within represents the number of times the revision has been made.

- To indicate clearly a section revised, show in the lower outside section of the corresponding page.
  A number within represents the number of times the revision has been made.

NOTE

Revision marks shown in a page are restricted only to the latest ones with the old ones deleted.

- When a page revised in Ver. 2.0 has been changed in Ver. 3.0:
  The revision marks for Ver. 3.0 only are shown with those for Ver. 2.0 deleted.
- When a page revised in Ver. 2.0 has not been changed in Ver. 3.0:
  The revision marks for Ver. 2.0 are left as they are.

2005/08	1.0	—	Issue of the first edition
Date	Service manual Ver.	Revision mark	Descriptions of revision

CONTENTS

DF-605

Outline

1. Product specifications 1
2. Paper Feed Path 4
2.1 In 1-sided mode 4
2.2 In 2-sided mode 4

Composition/Operation

3. Composition 5
4. Drive 6
5. Operation 7
5.1 Document pick-up mechanism 7
5.1.1 Pick-up operation 7
5.2 Document feed/transport mechanism 8
5.3 Raised/lowered position detecting mechanism 12
5.3.1 Document size detection 12
5.3.2 Raised/lowered position detection 12

Blank Page

Outline

1. Product specifications

A. Type

Name	Reverse Automatic Document Feeder	
Type	Paper Feed	Paper Feed from top of stack
	Turnover	Switch back system
	Paper Exit	Straight exit system
Installation	Screw cramp to the main unit	
Document Alignment	Center	
Document Loading	Left image side up	

B. Functions

Modes	1-Sided Mode / 2-Sided Mode

C. Paper type

Type of Document	Standard Mode Plain Paper	1-Sided Mode 35 to 128 g/m^2 (9.25 to 34 lb)
		2-Sided Mode 50 to 128 g/m^2 (13.25 to 34 lb)
	Mixed Original Detection Mode Plain Paper	1-Sided / 2-Sided Mode 50 to 128 g/m^2 (13.25 to 34 lb)
	FAX Mode Plain Paper	1-Sided Mode 35 to 128 g/m^2 (9.25 to 34 lb)
		2-Sided Mode 50 to 128 g/m^2 (13.25 to 34 lb)
Detectable Document Size*1	Metric area B6R to A3 Inch area 5.5 × 8.5R / 5.5 × 8.5 to 11 × 17	
Capacity	80 sheets (80 g/m^2) or load height of 11 mm or less.	

*1: For the Combined Original Detection Mode, Refer to the Mixed Original Detection Enabled Size Combination Table.

D. Paper feed prohibited originals

- If fed, trouble occurrence will be highly possible.

Type of Original	Possible Trouble
Original that is stapled or clipped.	Feed failure, damage to the original, or drive failure due to clip clogging
Book original	Feed failure, damage to the original, or drive failure
Original weighing less than 35g/m^2 or 129g/m^2 or more	Feed failure
Torn original	Feed failure, damaged sheet
Highly curled original (15 mm or more)	Original misfeed due to dog-ear or skew
OHP transparencies	Feed failure
Label Sheet	Feed failure
Offset master	Feed failure
Sheets clipped or notched	Damaged sheet
Sheets patched	Patched part folded or torn sheet, Sheets misfed

E. Paper feed not guaranteed originals

- If fed, paper feed will be possible to some extent but trouble occurrence will be possible.

Type of Original	Possible Trouble
Sheets lightly curled (Curled amount: 10 - 15 mm)	Dog-eared, exit failure
Heat Sensitive Paper	Edge folded, exit failure, transport failure
Coated Paper (Ink Jet Paper)	Take-up failure, transport failure
Translucent paper	Take-up failure, transport failure
Paper immediately after paper exit from the main unit	Take-up failure, transport failure
Paper with many punched holes (e.g., loose leaf) limited to vertical feeding	Multi-page feed due to flashes from holes
Sheets with 2 to 4 holes	Transport failure
Sheets two-folded or Z-folded	Transport failure, image deformation
Sheets with rough surface (e.g., letterhead)	Take-up failure
Sheets folded	Image deformation, multi-page feed, take-up failure

F. Mixed original feed chart

For Metric

	Max. Original Size	297 mm		257 mm		210 mm		182 mm	148 mm
Mixed Original Size		A3	A4	B4	B5	A4R	A5	B5R	A5R
297 mm	A3	OK	OK	-	-	-	-	-	-
	A4	OK	OK	-	-	-	-	-	-
257 mm	B4	OK	OK	OK	OK	-	-	-	-
	B5	OK	OK	OK	OK	-	-	-	-
210 mm	A4R	OK*	OK*	OK	OK	OK	OK	-	-
	A5	NG	NG	OK	OK	OK	OK	-	-
182 mm	B5R	NG	NG	OK*	OK*	OK	OK	OK	-
148 mm	A5R	NG	NG	NG	NG	NG	NG	OK	OK
123 mm	B6R	NG	NG	NG	NG	NG	NG	NG	OK

For Inch

	Max. Original Size	11		8.5			5.5
Mixed Original Size		11 x 17	8.5 x 11	8.5 x 14	8.5 x 11R	5.5 x 8.5	8.5 x 5.5R
11	11 x 17	OK	OK	-	-	-	-
	8.5 x 11	OK	OK	-	-	-	-
8.5	8.5 x 14	OK*	OK*	OK	OK	OK	-
	8.5 x 11R	OK*	OK*	OK	OK	OK	-
5.5	8.5 x 5.5	NG	NG	OK	OK	OK	-
	8.5 x 5.5R	NG	NG	NG	NG	NG	OK

OK	Mixed Original Feed available (Tilted with in 1.5 % or less)
NG	NO. Mixed Original Feed
-	Can not Set Original
*	Tilted with in 2 % or less is 80 %

G. Machine specifications

Power Requirements	DC 24 V (supplied from the main unit)
	DC 5 V (generated within the Automatic Document Feeder)
	DC 3.3 V (supplied from the main unit)
Max. Power Consumption	48 W or less
Dimensions	582 mm (W) x 558 mm (D) x 145 mm (H) 23 inch (W) x 20.5 inch (D) x 5.75 inch (H)
Weight	10 kg (22 lb) or less

H. Operating

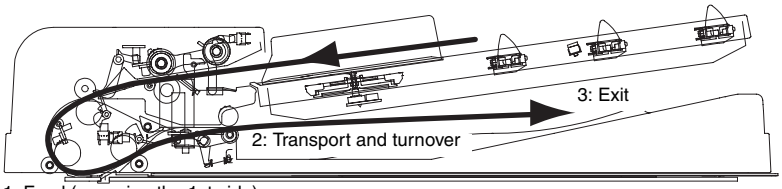
- Conforms to the operating environment of the main unit.

NOTE

- **These specifications are subject to change without notice.**

2. Paper Feed Path

2.1 In 1-sided mode



1: Feed (scanning the 1st side)

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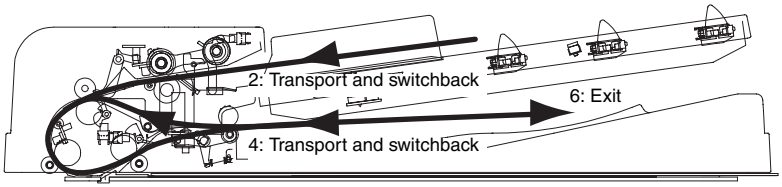
2.2 In 2-sided mode



1: Feed (scanning the 1st side)

3: Transport and turnover (scanning the 2nd side)

5: Transport

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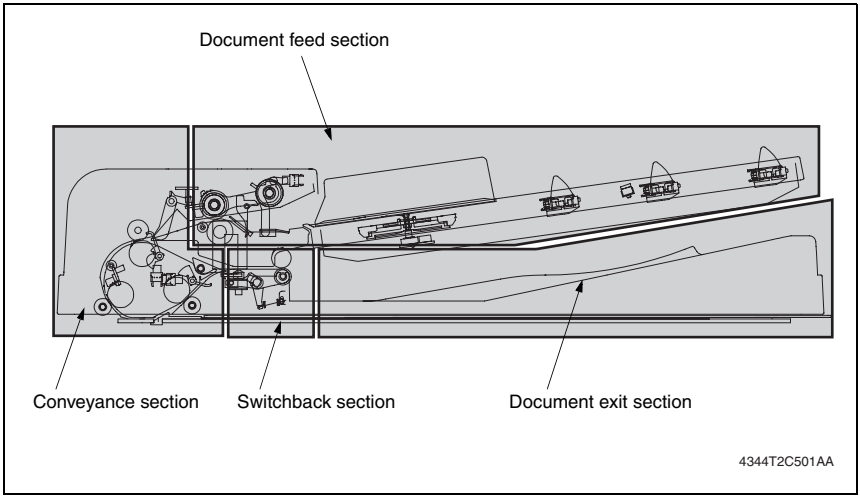
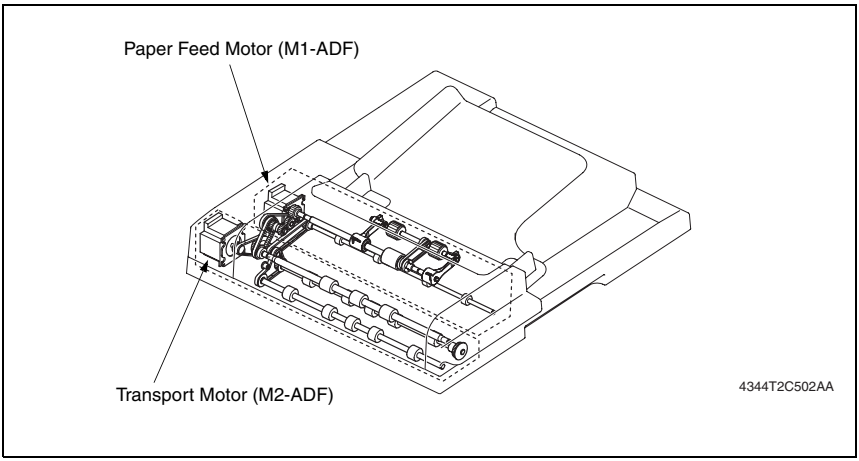
Composition/Operation

3. Composition



4. Drive


Paper Feed Motor (M1-ADF)
Transport Motor (M2-ADF)
4344T2C502AA

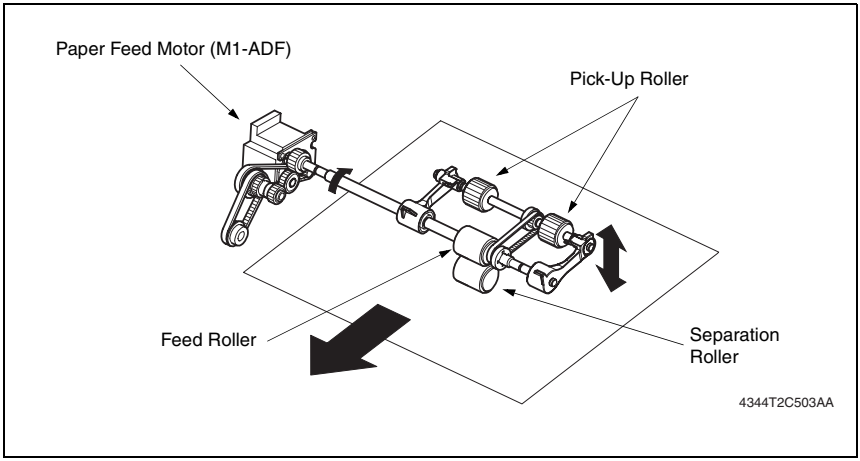
5. Operation

5.1 Document pick-up mechanism

- The Document Pick-Up Section consists of the Pick-Up Rollers, Feed Roller and Separation Roller, and this section is driven by the Paper Feed Motor.

5.1.1 Pick-up operation

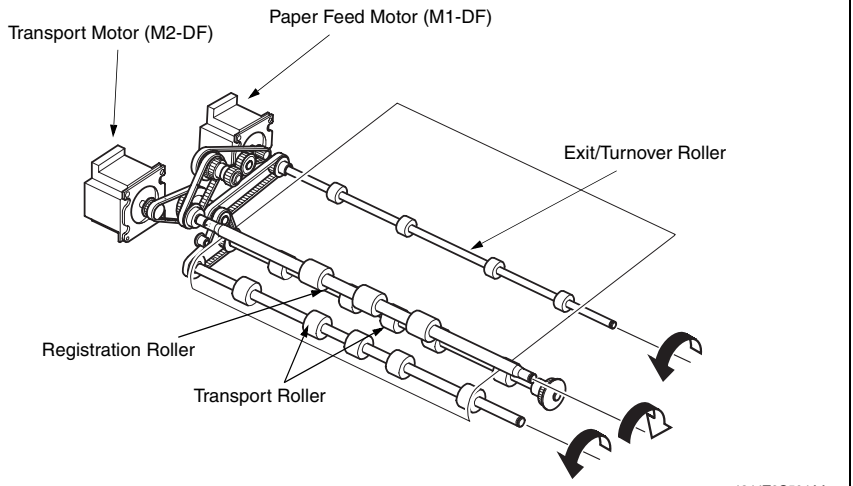
- When the Start key is pressed, the Paper Feed Motor starts turning backward, causing the Pick-Up Roller to lower and start turning at the same time. At the same time, the Feed Roller starts turning.
- The Pick-Up Rollers are in the raised position when in the standby state and in the lowered position during feeding.



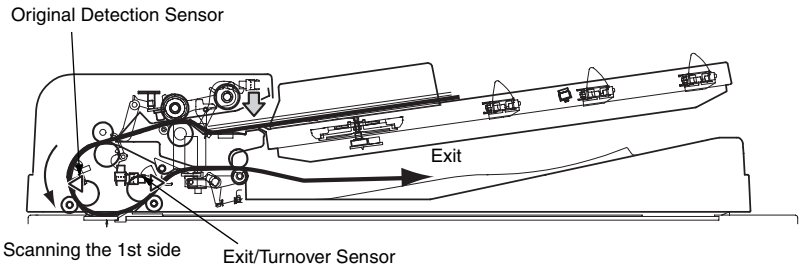
5.2 Document feed/transport mechanism

- When the document reaches the Registration Sensor, the Feed Roller starts turning forward and, at the same time that the Pickup Roller goes up, drive is then supplied to the Registration Roller.
- When the Transport Motor starts turning forward, the two Transport Rollers and the Exit/Turnover Roller feed the document toward the exit direction.

Parts	Direction of Rotation	Details
Paper Feed Motor (M1-ADF)	Backward rotation	The Pickup Rollers lower and start turning and the Feed Roller turns.
	Forward rotation	The Registration Roller turns.
Transport Motor (M2-ADF)	Backward rotation	The Transport Roller and Exit/Turnover Roller turn in the direction to turn over the original.
	Forward rotation	The Transport Roller and Exit/Turnover Roller turn in the direction to feed the original out.



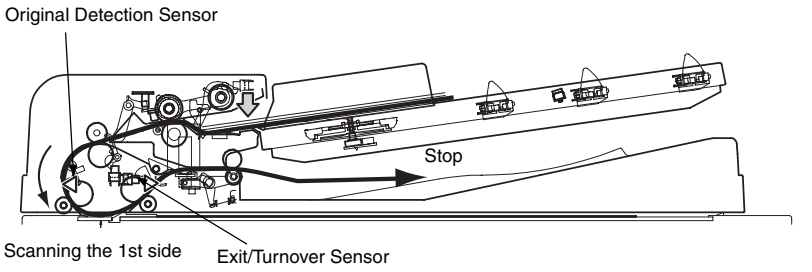
A. Operation flow in the 1-sided mode



1. When the Start key is pressed, the Paper Feed Motor starts turning backward, causing the Pick-Up Roller to lower and start a paper take-up sequence.
2. The scanning of the 1st side is started after the lapse of a given period of time after the Original Detection Sensor has been activated by the leading edge of the original.
3. The original is transported for a given period of time after the trailing edge of the last page of the document has deactivated the Exit/Turnover Sensor. It is then fed into the Exit Tray and the Transport Motor is deenergized.

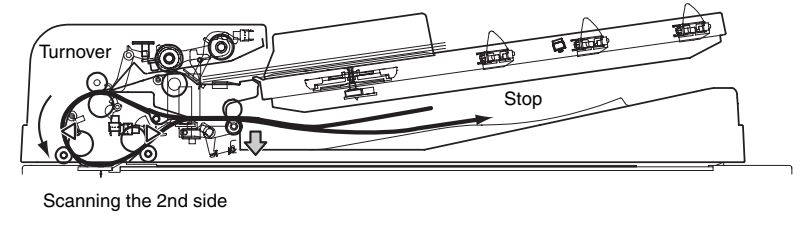
B. Operation flow in the 2-sided mode

1. When the Start key is pressed, the Paper Feed Motor starts turning backward, causing the Pick-Up Roller to lower and start feeding the 1st page of the document. The scanning of the 1st side is started after the lapse of a given period of time after the Original Detection Sensor has been activated by the leading edge of the 1st page.
   The Transport Motor is deenergized to stop the original after the lapse of a given period of time after the trailing edge of the 1st page has deactivated the Exit/Turnover Sensor.



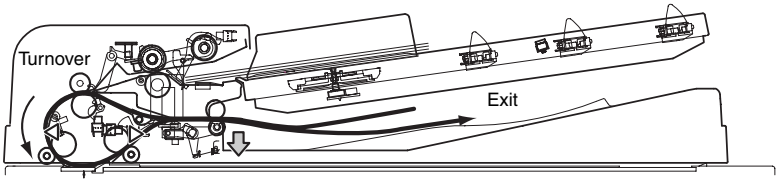
4344T2C506AA

2. The Transport Motor is turned backward to turn over the original. After the Registration Roller, the Transport Motor is turned forward to allow the Scanner to scan the backside of the 1st page.
3. After the transport sequence for turnover has been started, the Exit Roller Retraction Solenoid is energized so that the Exit/Turnover Roller is retracted.



4344T2C505AA

4. To ensure that pages of the document are in the proper order, the page is turned over again before being ejected into the Exit Tray.



Scanning the 2nd side

4344T2C505AA

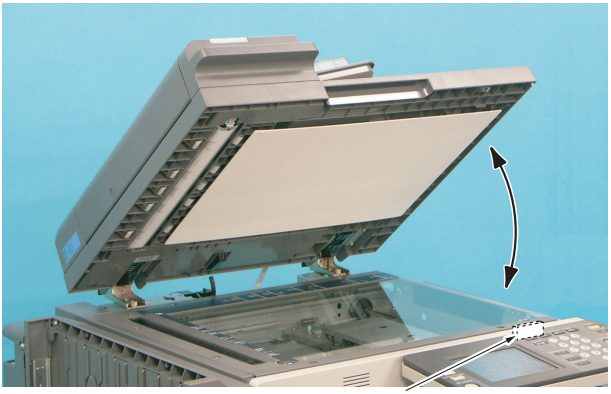
5.3 Raised/lowered position detecting mechanism

5.3.1 Document size detection

- The 15 degree Open Detection Mechanism enables the main unit to detect the document size when the DF is used as the Original Cover of the main unit, there is the Lever Actuator provided in the DF body that blocks or unblocks a sensor to initiate a reconfirmation of the original size as read by the original size detection sensors.

5.3.2 Raised/lowered position detection

- The Raised/Lowered Position Detection Mechanism uses a magnet installed in the DF body to allow the main unit to know that the DF is raised or lowered. This magnet actuates the Size Reset Switch on the main unit to perform this operation.



Size Reset Switch (SW201) 4344T2C507AA

KONICA MINOLTA

SERVICE MANUAL

THEORY OF OPERATION

PC-102/PC-202

2005.08
KONICA MINOLTA BUSINESS TECHNOLOGIES, INC. Ver. 1.0

Revision history

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Therefore, the descriptions given in this service manual may not coincide with the actual machine.

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2005/08	1.0	—	Issue of the first edition
Date	Service manual Ver.	Revision mark	Descriptions of revision

CONTENTS

PC-102/PC-202

Outline

1. Product specifications 1
1.1 Type 1
1.2 Paper type 1
1.3 Machine specifications 1
1.4 Operating environment 1
2. Paper Feed Path 2

Composition/Operation

3. Composition 3
4. Drive system 4
5. Operations 5
5.1 Paper Feed Section 5
5.1.1 Vertical transport drive mechanism 5
5.1.2 Paper lifting motion 6
5.2 Cassette Section 7
5.2.1 Paper size detection 7
5.2.2 Paper level indicator mechanism 8

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Outline

1. Product specifications

1.1 Type

Name	2 way Paper Take-Up Cabinet
Type	Front loading type 2 way paper take-up device
Installation	Desk type
Document Alignment	Center

1.2 Paper type

Paper Type	Plain paper	56 to 90 g/m^2 (15 to 24 lb)
Paper Size	A5R to A3, 5-1/2 × 8-1/2R to 11 × 17	
Capacity	3rd Drawer	500 sheets
	4th Drawer	500 sheets

1.3 Machine specifications

Power Requirements	DC 24 V ± 10 % (supplied from the main unit)
	DC 5 V ± 5 %
Max. Power Consumption	15 W or less
Dimensions	570 mm (W) × 548 mm (D) × 263 mm (H) 22-1/2 inch (W) × 21-1/2 inch (D) × 10-1/4 inch (H)
Weight	PC-102: 22.0 kg (48-1/2 lb) PC-202: 25.9 kg (57 lb)

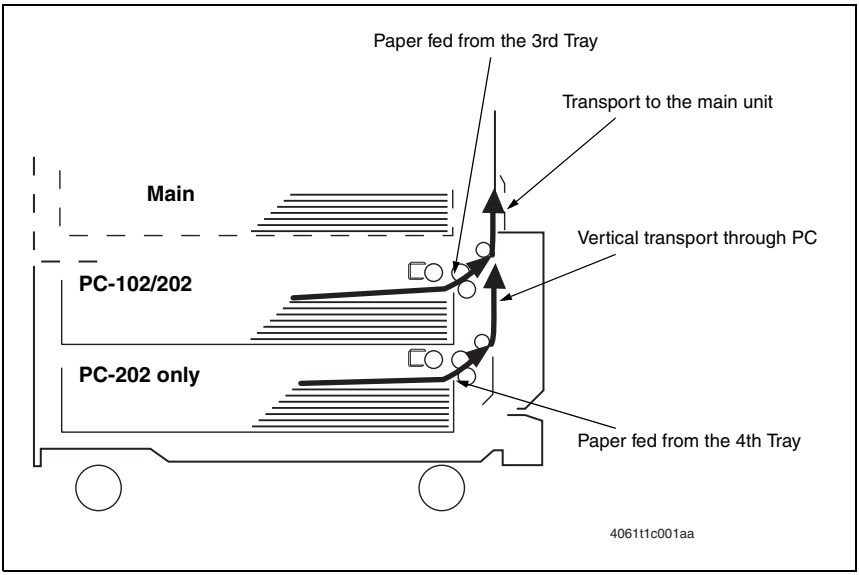
1.4 Operating environment

- Conforms to the operating environment of the main unit.

NOTE

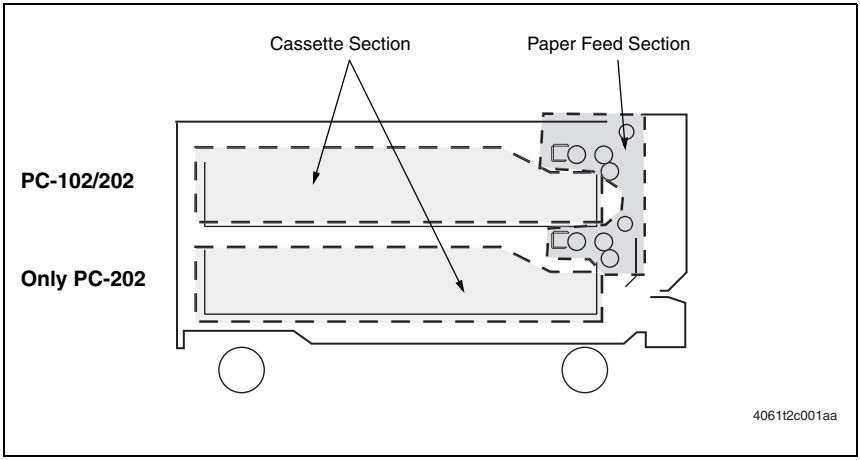
- **These specifications are subject to change without notice.**

2. Paper Feed Path



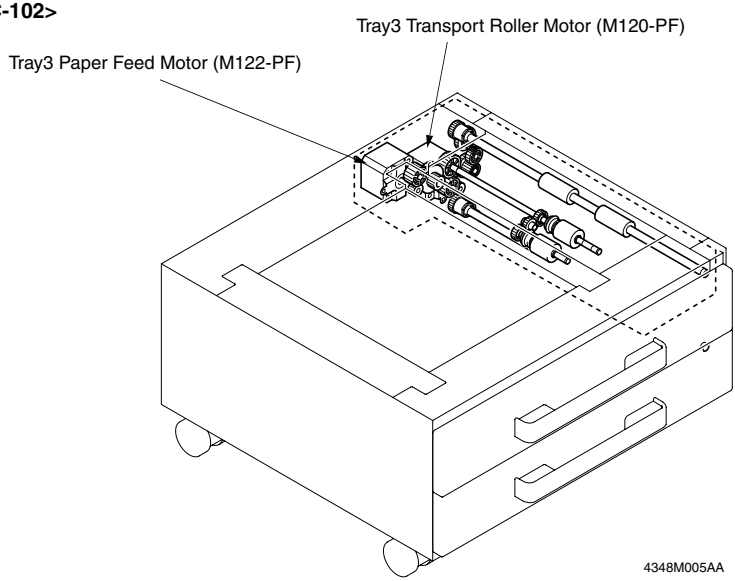
Composition/Operation

3. Composition

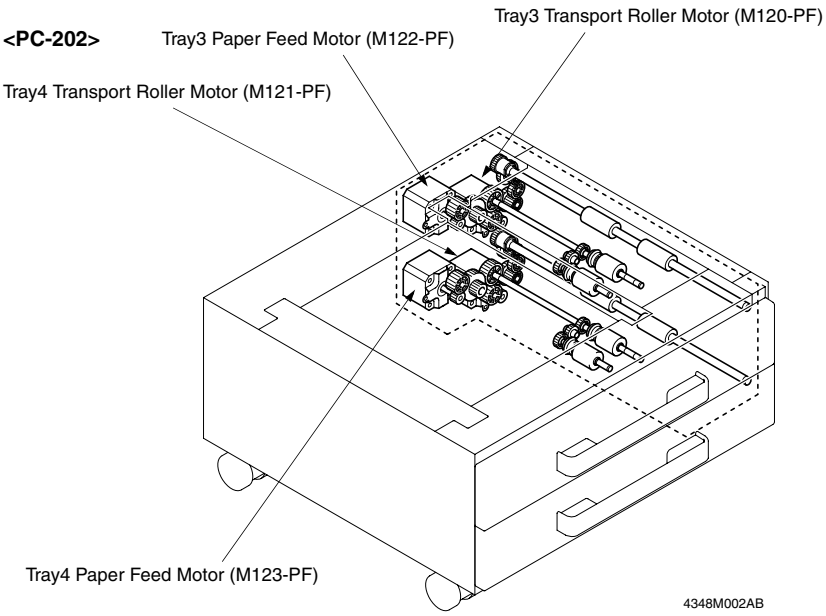


4. Drive system

<PC-102>



<PC-202>

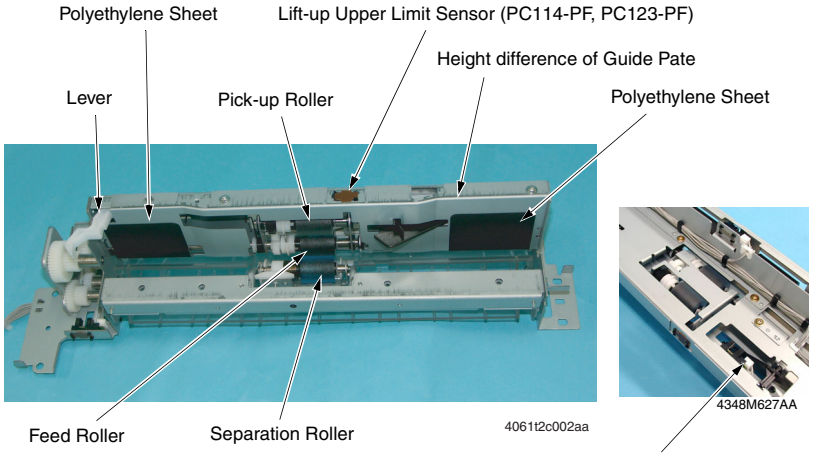

Tray3 Transport Roller Motor (M120-PF)
Tray3 Paper Feed Motor (M122-PF)
Tray4 Transport Roller Motor (M121-PF)
Tray4 Paper Feed Motor (M123-PF)
4348M002AB

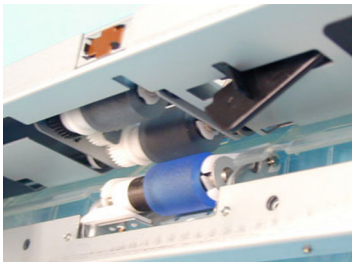
5. Operations

5.1 Paper Feed Section

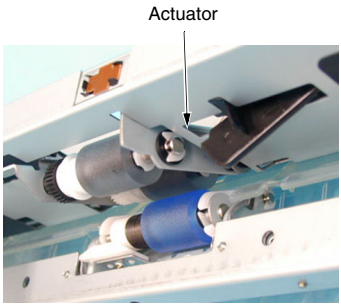
5.1.1 Vertical transport drive mechanism

- The Paper Feed Motor drives the Pick-up Roller and Paper Take-up Roller to take up and feed a sheet of paper into the main unit.
- Then, the Transport Roller Motor transports the paper through the vertical transport section.
- The Pick-up Roller takes up sheets of paper and the Paper Take-up and Separation Rollers ensure that only one sheet of paper is separated and fed into the main unit.
- When the drawer is slid in, the lever is pushed to lower the Pick-up Roller.
- The Lift-up Upper Limit Sensor then detects the upper limit position when the paper lifting plate is raised.
- The Paper Empty Sensor detects when paper in the drawer runs out.
- The polyethylene sheet and Height difference of Guide Plate are reduces resistance between a curled sheet of paper and guide, thereby preventing skewed feeding.





Pick-up Roller Home Position 4348M602AA



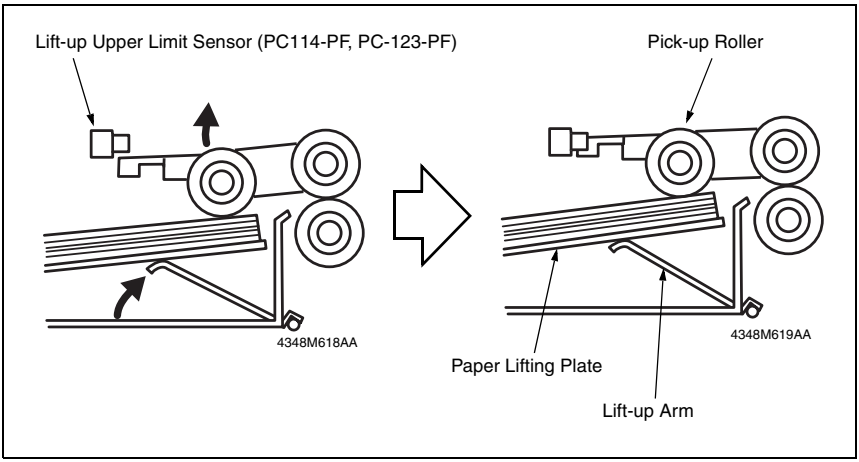
Pick-up Roller Feed Position 4348M603AA

5.1.2 Paper lifting motion

- When the drawer is slid into the main unit and the Set Sensor is activated, the Lift-up Motor starts rotating to raise the Paper Lifting Plate.
- The paper stack of the drawer pushes up the Pick-up Roller. When the upper limit position is detected through the action of the actuator, it stops raising the paper lifting plate.
- As paper is consumed during the print cycle and the Pick-up Roller is lowered, the Lift-up Motor is energized until the Lift-up Upper Limit Sensor is blocked again.

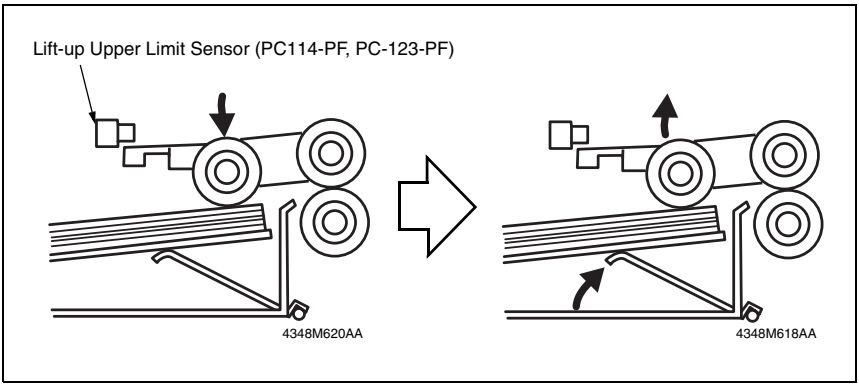
A. When the drawer is slid in

1. The paper lifting plate goes up and the top surface of the paper stack pushes up the roller.
2. The lifting motion stops as soon as the sensor detects the upper limit position.



B. During a print cycle

1. As the paper is consumed, the sensor is unblocked.
2. The paper lifting plate goes up.

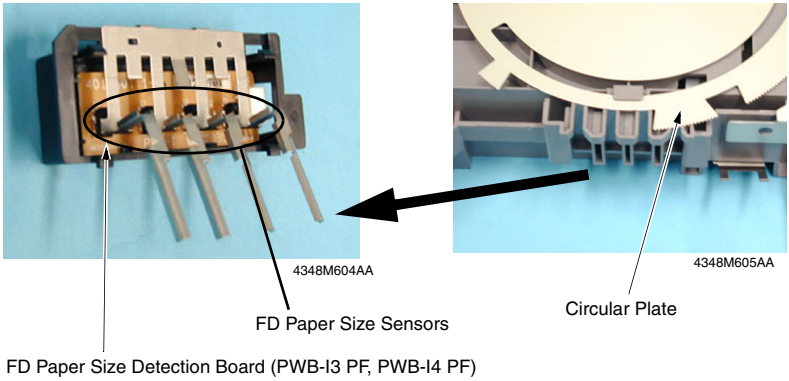


5.2 Cassette Section

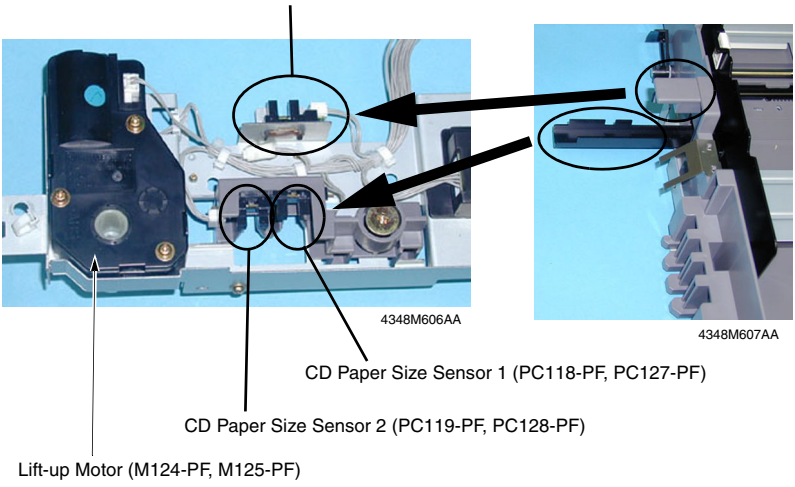
5.2.1 Paper size detection

- When the Trailing Edge Stop of the drawer is moved, the circular plate located on the bottom of the drawer turns, allowing the four FD Paper Size Sensors on the FD Paper Size Detection Board.
- Moving the Edge Guide activates or deactivates the two CD Paper Size Sensors through the cutout in the lever.
- The combination of the four FD Paper Size Sensors and two CD Paper Size Sensors that are either activated or deactivated determines the size of the paper loaded in the drawer.
- The Tray Set Sensor detects that the drawer is slid into position as it is slid in.

Length Detection

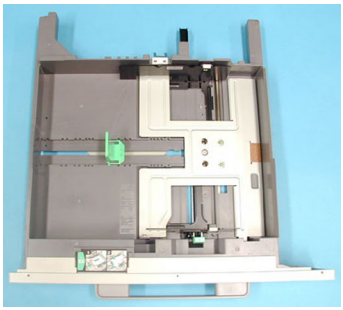


Width Detection

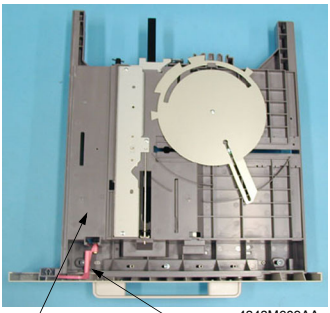

Tray Set Sensor (PC122-PF, PC-121-PF)
4348M606AA
4348M607AA
CD Paper Size Sensor 1 (PC118-PF, PC127-PF)
CD Paper Size Sensor 2 (PC119-PF, PC128-PF)
Lift-up Motor (M124-PF, M125-PF)

5.2.2 Paper level indicator mechanism

- All drawers now use the universal paper size tray for greater functionality.
- There is a window in the front cover of the drawer that serves as the Paper Level Indicator showing the amount of paper that is still available for use.
- A red lever is attached to the paper lifting plate of the drawer and as the paper lifting plate raises, the red lever becomes visible in the window.
- The more the red lever is visible, the lesser the amount of paper will be available for use.



4348M608AA



4348M609AA

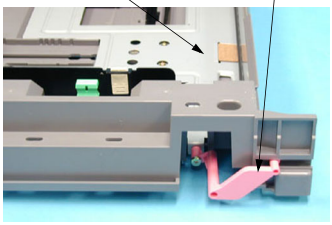
Cassette bottom plate

Lever

paper lifting plate

4348M610AA

Paper Level Indicator on the front cover of the drawer



4348M611AA

Operated by the paper lifting plate of the drawer

KONICA MINOLTA

SERVICE MANUAL

THEORY OF OPERATION

PC-402

2005.08

KONICA MINOLTA BUSINESS TECHNOLOGIES, INC. Ver. 1.0

Revision history

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2005/08	1.0	—	Issue of the first edition
Date	Service manual Ver.	Revision mark	Descriptions of revision

CONTENTS

PC-402

Outline

1. Product specification 1
1.1 Type 1
1.2 Paper type 1
1.3 Machine specifications 1
1.4 Operating environment 1
2. Paper Feed Path 2

Composition/Operation

3. Composition 3
4. Drive 4
5. Operations 5
5.1 Paper Feed Section 5
5.1.1 Paper Feed drive mechanism 5
5.2 Tray Section 6
5.2.1 Elevator tray mechanism 6
5.2.2 Shift Gate drive mechanism 7
5.2.3 Shifter drive mechanism 7
5.2.4 Paper empty detection 8

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Outline

1. Product specification

1.1 Type

Name	Large Capacity Tray
Type	Front loading type LCT
Installation	Desk type
Document Alignment	Center

1.2 Paper type

Paper Type	Plain paper	56 to 90 g/m^2 (15 to 24 lb)
Paper Size	A4, 8-1/2 × 11	
Capacity	2500 sheets (80 g/m^2, 21-1/4 lb)	

1.3 Machine specifications

Power Requirements	DC 24 V ± 10 % (supplied from the main unit)
	DC 5 V ± 5 %
Max. Power Consumption	45 W or less
Dimensions	570 mm (W) × 548 mm (D) × 263 mm (H) 22-1/2 inch (W) × 21-1/2 inch (D) × 10-1/4 inch (H)
Weight	25.9 kg (57 lb)

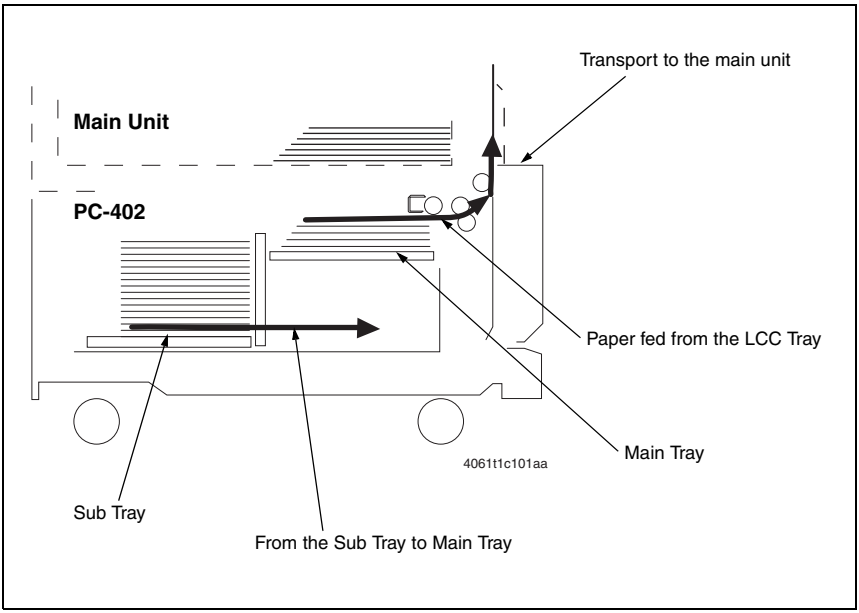
1.4 Operating environment

- Conforms to the operating environment of the main unit.

NOTE

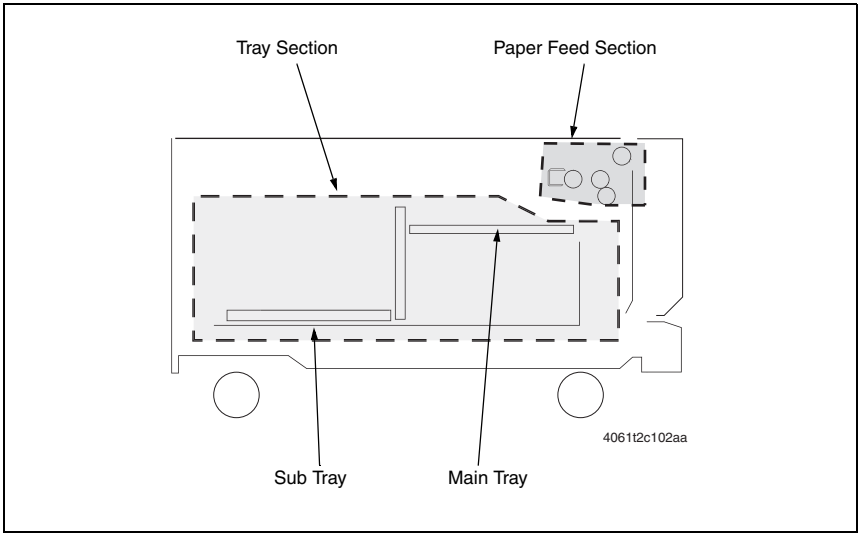
- **These specifications are subject to change without notice.**

2. Paper Feed Path

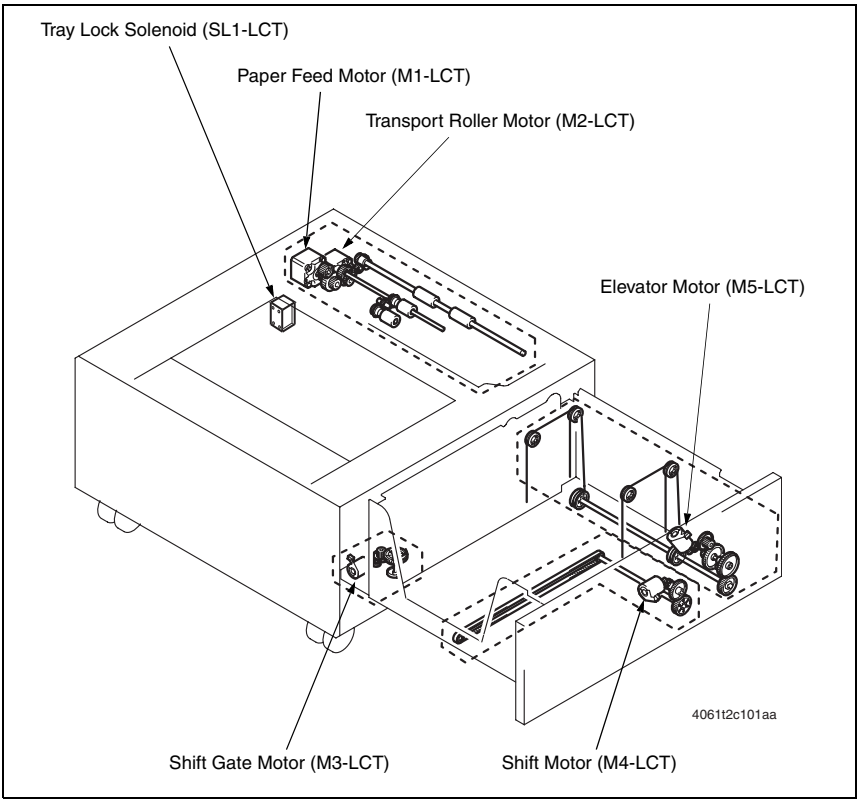


Composition/Operation

3. Composition



4. Drive

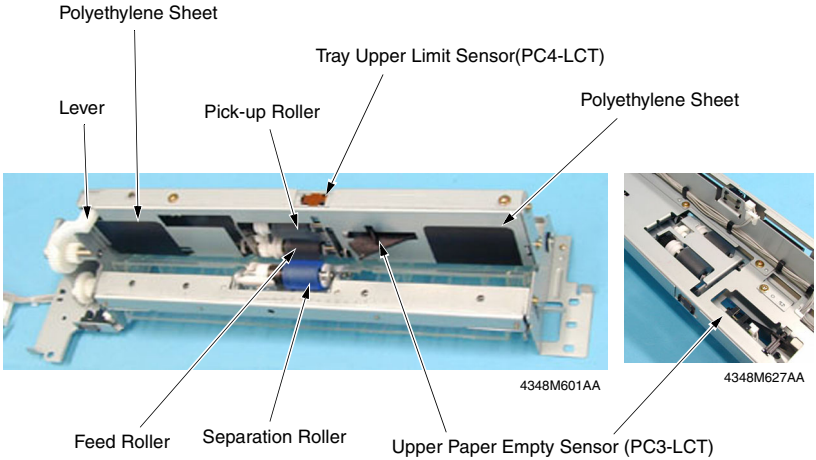

Tray Lock Solenoid (SL1-LCT)
Paper Feed Motor (M1-LCT)
Transport Roller Motor (M2-LCT)
Elevator Motor (M5-LCT)
4061t2c101aa
Shift Gate Motor (M3-LCT)
Shift Motor (M4-LCT)

5. Operations

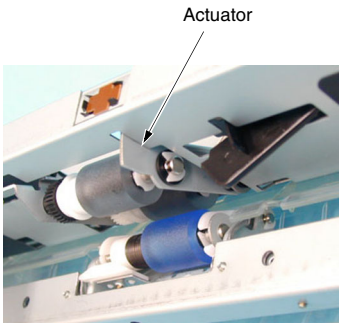
5.1 Paper Feed Section

5.1.1 Paper Feed drive mechanism

- The Paper Feed Motor drives the Pick-up Roller and Paper Take-up Roller to take up and feed a sheet of paper into the main unit.
- Then, the Transport Roller Motor transports the paper through the vertical transport section.
- The Pick-up Roller takes up sheets of paper and the Paper Take-up and Separation Rollers ensure that only one sheet of paper is separated and fed into the main unit.
- When the drawer is slid in, the lever is pushed to lower the Pick-up Roller.
- The Tray Upper Limit Sensor then detects the upper limit position when the paper lifting plate is raised.
- The Upper Paper Empty Sensor detects when paper in the drawer runs out.



Pick-up Roller Home Position

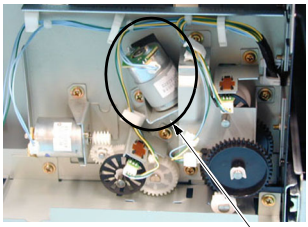


Pick-up Roller Feed Position

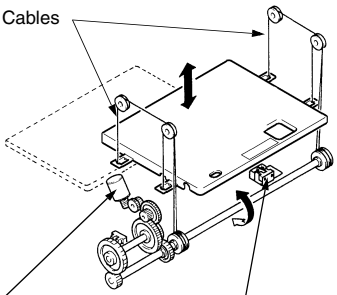
5.2 Tray Section

5.2.1 Elevator tray mechanism

- The Main Tray is suspended by the cables at the front and rear.
- As the Elevator Motor turns forward or backward, the cables are wound to raise or lower the tray.
- The Tray Lower Position Sensor detects the tray at its lower limit position.



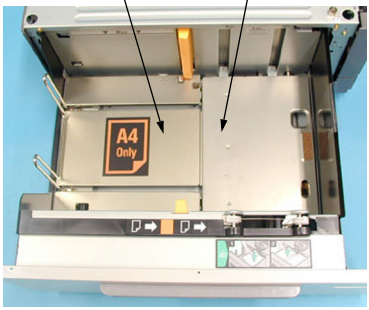
4348M614AA



4348M621AA

Tray Lower Position Sensor (PC13-LCT)

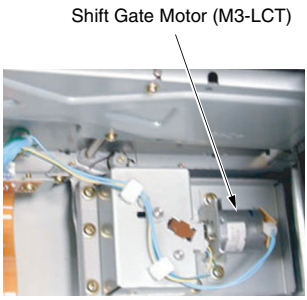
Elevator Motor (M5-LCT)

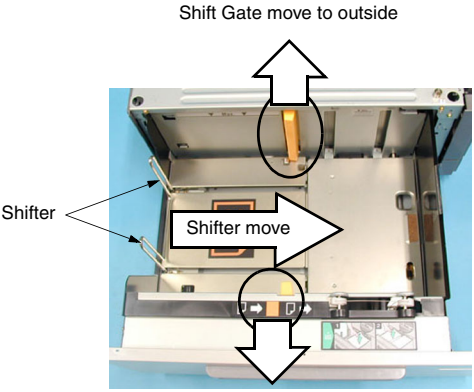


4348M613AA

5.2.2 Shift Gate drive mechanism

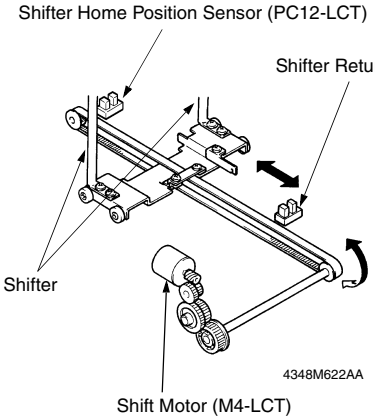
- If the Main Tray runs out of paper, while the Sub Tray is loaded with paper, the paper stack on the Sub Tray is moved to the Main Tray.
- At this time, the Shift Gate Motor is energized to retract the front and rear Shift Gates.

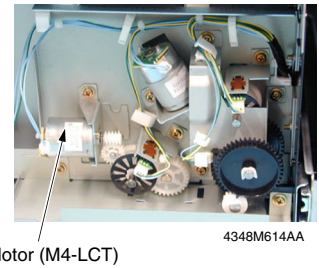




5.2.3 Shifter drive mechanism

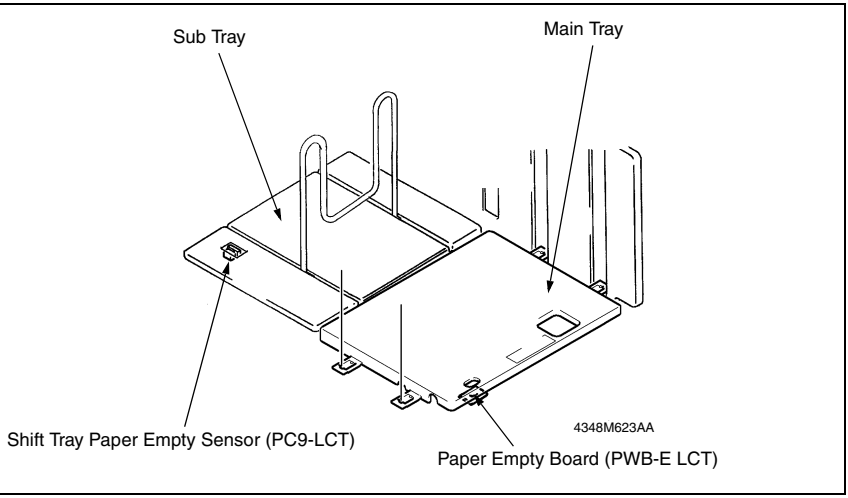
- Then, the Shift Motor is energized to move the Shifter so that the paper stack on the Sub Tray is moved onto the Main Tray.
- The Shifter continues moving and stops when the Shifter Return Position Sensor is activated. When the Drawer Release button is thereafter pressed, the Shifter starts moving and stops as soon as the Shifter Home Position Sensor is activated.





5.2.4 Paper empty detection

- Paper empty detection of Main Tray is performed by Paper Empty Board.
- Paper empty detection of Sub Tray is performed by Shift Tray Paper Empty Sensor.



KONICA MINOLTA

SERVICE MANUAL

THEORY OF OPERATION

JS-502

2005.08

KONICA MINOLTA BUSINESS TECHNOLOGIES, INC. Ver. 1.0

Revision history

After publication of this service manual, the parts and mechanism may be subject to change for improvement of their performance.
Therefore, the descriptions given in this service manual may not coincide with the actual machine.

When any change has been made to the descriptions in the service manual, a revised version will be issued with a revision mark added as required.

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- To indicate clearly a section revised, show to the left of the revised section.
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2005/08	1.0	—	Issue of the first edition
Date	Service manual Ver.	Revision mark	Descriptions of revision

CONTENTS

JS-502

Outline

1. System configuration 1
2. Paper Feed Path 2

Composition/Operation

3. Composition 3
4. Operations 4
   4.1 Job Separator Transport/Exit 4

Blank Page

Outline

1. System configuration

A. Type

Name	Job Separator
Type	Expansion drawer
Installation	Installed in the copier
Document Alignment	Center

B. Paper type

Exit Tray	Size	Type		Capacity
Tray 1	A6R to A3R (5.5 to 11 x 17 inch) width: 90 mm to 297 mm (3.5 to 11.75 inch) length: 139.7 mm to 432 mm (5.5 to 17 inch)	Plain Paper (56 to 90 g/m^2, 15 to 24 lb)		250 sheets
		Special	OHP transparencies	20 sheets
			Thick paper (91 to 210g/m^2, 24.25 to 55.75 lb)	
			Envelope	
			Label	
			Letterhead	
			Governmentstandard postcards	
Tray 2	A5 to A3R (5.5 to 8.5 inch) Max.: 297 mm x 432 mm (11.75 to 17 inch) Min.: 139.7 mm x 139.7 mm (5.5 to 5.5 inch)	Plain Paper (56 to 90 g/m^2, 15 to 24 lb)		100 sheets

C. Machine specifications

Power Requirements	DC 5 V ± 5 % (supplied from the main unit)
Max. Power Consumption	0.2 W or less
Dimensions	450 mm (W) x 443 mm (D) x 75 mm (H) 17.75 inch (W) x 17.5 inch (D) x 3 inch (H)
Weight	Approx. 1.7 kg (3.75 lb)

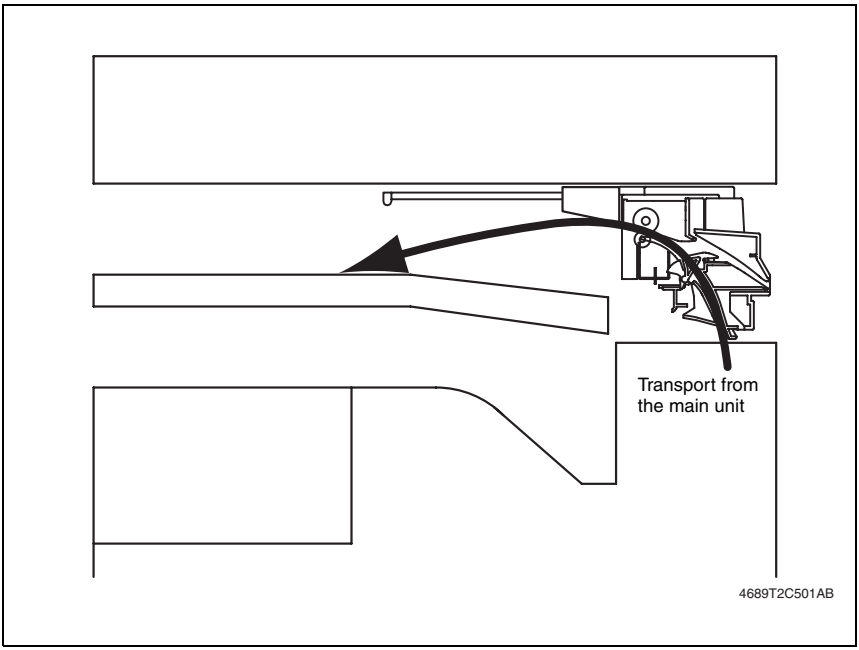
D. Operating environment

- Conforms to the operating environment of the main unit.

NOTE

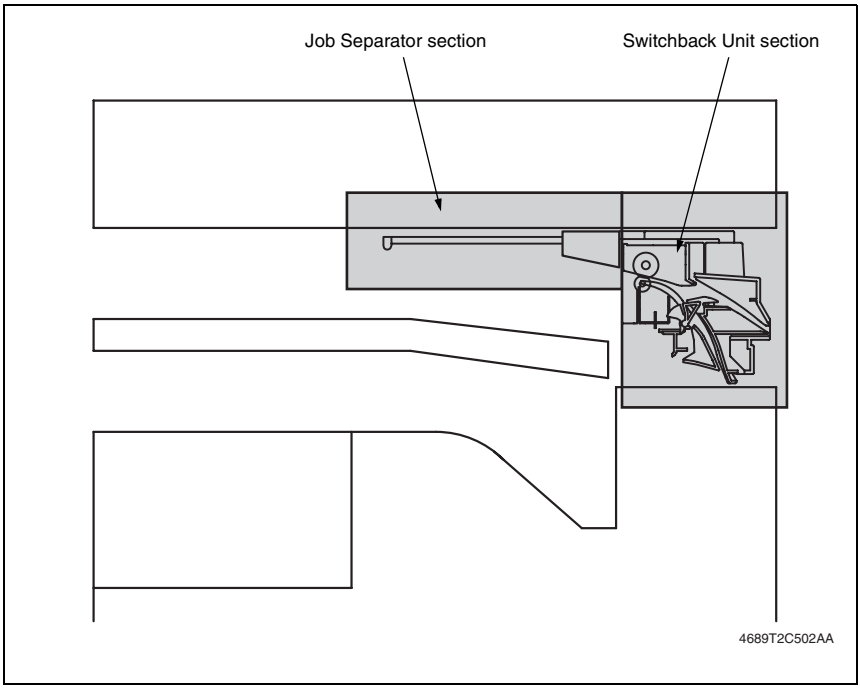
- **These specifications are subject to change without notice.**

2. Paper Feed Path



Composition/Operation

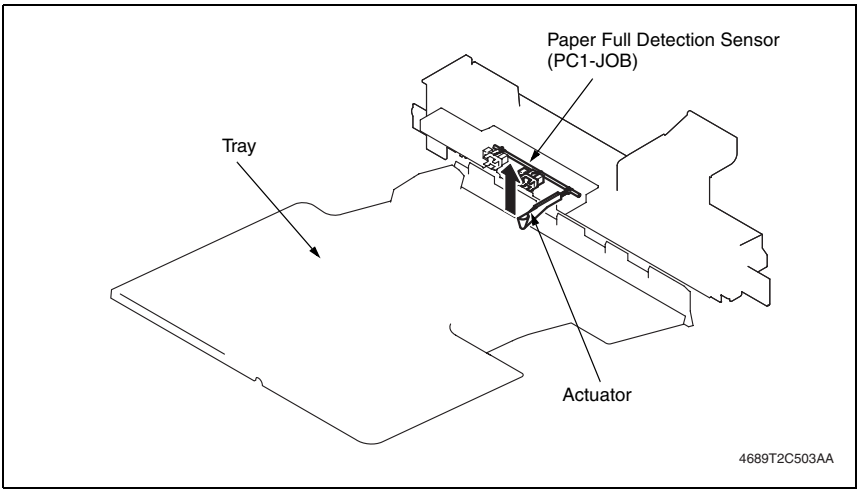
3. Composition



4. Operations

4.1 Job Separator Transport/Exit

- The Switchback Unit functions to transport paper through, and feed it out from, the Job Separator.
- The paper sensor section of the Job Separator is mounted to the Switchback Unit, thereby detecting paper.
- When paper stacks up on the Job Separator, the actuator is pushed up by the paper, indicating that there is paper at the exit port.



KONICA MINOLTA

SERVICE MANUAL THEORY OF OPERATION

FS-508/PU-501/ OT-601

2005.08

KONICA MINOLTA BUSINESS TECHNOLOGIES, INC. Ver. 1.0

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2005/08	1.0	—	Issue of the first edition
Date	Service manual Ver.	Revision mark	Descriptions of revision

CONTENTS

FS-508/PU-501/OT-601

Outline

1. Product specifications 1
1.1 FS-508 1
1.2 PU-501 3
1.3 OT-601 4
2. Paper Feed Path 5
2.1 Feeding Paper to the 1st Exit Tray 5
2.2 Feeding Paper to the 2nd Exit Tray 5
2.3 Feeding Paper to the 2nd Exit Tray (When OT-601 is Mounted) 6

Composition/Operation

3. Composition 7
4. Drive 8
5. Operations 9
5.1 Transport Section 9
5.1.1 Entrance/Transport section 10
5.1.2 Intermediate Transport Section 10
5.1.3 Exit Transport Section 11
5.2 Elevator Section 12
5.2.1 Elevator mechanism 12
5.2.2 Elevator Tray Ascent/Descent 12
5.2.3 Tray Position Detection Mechanism 13
5.2.4 Shutter Open/Close Mechanism 16
5.3 Paper aligning section 17
5.3.1 Paper aligning mechanism (sub scan direction) 17
5.3.2 Paper aligning mechanism (main scan direction) 18
5.3.3 Exit mechanism 19
5.4 Stapling 21
5.4.1 Stapling mechanism 21
5.4.2 Stapling Unit moving mechanism 22
5.4.3 Stapling Position 22
5.4.4 Staple sheet empty detection 23
6. Punch Kit (PK-6) 24
6.1 Composition 24

6.2 Operation 24
6.2.1 Skew correction mechanism 24
6.2.2 Punch mechanism 25
6.2.3 Punch status detection 25
6.2.4 Punch Trash Box full detection mechanism 26
7. Output Tray (OT-601) 27
7.1 Composition 27
7.2 Operation 27
7.2.1 Overview 27

Outline

1. Product specifications

1.1 FS-508

A. Type

Name	Multi staple finisher built into the copier
Installation	Installed in the copier
Document Alignment	Center
Consumables	Staples

B. Functions

Modes	Non sort, sort, group, sort stable, and punch (when PU-501 is mounted)

C. Paper type

(1) Non sort

<table>
<tr><th>Type</th><th>Size</th><th>Weight</th><th colspan="3">Max. Capacity</th></tr>
<tr><td rowspan="3">Plain paper</td><td rowspan="9">A6R to A3
5.5 to 11 x 17
Max.
297 mm x 431.8 mm
11.75 x 17 inch
Min.
100 mm x 139.7 mm
4 x 5.5 inch</td><td rowspan="3">56 to 90 g/m^2
15 to 24 lb</td><td>Exit Tray1</td><td colspan="2">200 sheets</td></tr>
<tr><td rowspan="2">Exit Tray2</td><td>A4R, 8.5 x 11R or less</td><td>1000 sheets</td></tr>
<tr><td>B4, 8.5 x 14R or greater</td><td>500 sheets</td></tr>
<tr><td>Thick paper</td><td>91 to 210 g/m^2
24.25 to 55.75 lb</td><td colspan="3" rowspan="7">20 sheets</td></tr>
<tr><td>OHP transparencies</td><td>-</td></tr>
<tr><td>Translucent paper</td><td>-</td></tr>
<tr><td>Governmentstandard postcards</td><td>-</td></tr>
<tr><td>Envelope</td><td>-</td></tr>
<tr><td>Label</td><td>-</td></tr>
<tr><td>Letterhead</td><td>-</td></tr>
</table>

(2) Sort/Group

<table>
<tr><th>Type</th><th>Size</th><th>Weight</th><th colspan="3">Max. Capacity</th></tr>
<tr><td rowspan="3">Plain paper</td><td rowspan="3">A6R to A3
5.5 to 11 x 17
Max.
297 mm x 431.8 mm
11.75 x 17 inch
Min.
182 mm x 139.7 mm
7.25 x 5.5 inch</td><td rowspan="3">56 to 90g/m^2
15 to 24 lb</td><td>Exit Tray1</td><td colspan="2">200 sheets</td></tr>
<tr><td rowspan="2">Exit Tray2</td><td>A4R, 8.5 x 11R or less</td><td>1000 sheets</td></tr>
<tr><td>B4, 8.5 x 14R or greater</td><td>500 sheets</td></tr>
</table>

(3) Sort Staple

Type	Size	Weight	Max. Capacity		
Plain paper	A6R to A3 5.5 to 11 x 17 Max. 297 mm x 431.8 mm 11.75 x 17 inch Min. 182 mm x 139.7 mm 7.25 x 5.5 inch	56 to 90g/m^2 15 to 24 lb	Exit Tray1	200 sheets	
			Exit Tray2	A4R, 8.5 x 11R or less	1000 sheets
				B4, 8.5 x 14R or greater	500 sheets

(4) Punch

Type	Size	Weight	Exit Tray
Plain paper	B5R/B5 to A3 8.5 to 11 x 17	60 to 90 g/m^2 15 to 24 lb	Exit Tray1 Exit Tray2 OT-601 MT-501

D. Stapling

Staple Filling Mode	Dedicated Staple Cartridge (5000 staples)	
Staple Detection	Available (Nearly Empty: 20 remaining staples)	
Stapling Position	Front: Diagonal 45° 1 point *1	A4, A3R, B5, B4R 8.5 x 11, 11 x 17
	Rear: Diagonal 45° 1 point *1	
	Front: Parallel 1 point	A4R, B5R, A5 8.5 x 11R, 8.5 x 114R, 5.5 x 8.5
	Rear: Parallel 1 point	
	Side: Parallel 2 point	A4, A4R, A3R, B5, B5R, B4R, A5 8.5 x 11, 8.5 x 11R, 8.5 x 14R, 11 x 17, 5.5 x 8.5
Manual Staple	None	

*1: Diagonal 30° for B5 and B4R

E. Hole Punch

No. of Holes	Metric: 4 holes, Inch: 2 holes / 3 holes
Punch dust full detection	Available

F. Machine specifications

Power Requirements	DC 24 V (supplied from the main unit)
	DC 5.1 V (generated by Finisher)
Max. Power Consumption	63 W
Dimensions	319 mm (W) x 558 mm (D) x 573 mm (H) 12.5 inch (W) x 22 inch (D) x 22.5 inch (H)
Weight	21.4 kg (47.25 lb)

G. Operating environment

- Conforms to the operating environment of the main unit.

1.2 PU-501

A. Type

Name	Punch Unit PU-501
Installation	Built into the Finisher
Paper Size	B5R/B5 to A3 8.5 x 11R, 8.5 x 11, 8.5 x 14R, 11 x 17
Paper Type	Plain Paper (60 to 163 g/m^2, 16 to 43.5 lb)
Punch Hole	Metric: 4 hole, Inch: 2, 3 hole
Number of Stored Punch Wastes	Metric (4 hole): For 1,500 sheets of paper (80 g/m^2) Inch (2, 3 hole): For 1,000 sheets of paper (75 g/m^2)
Document Alignment	Center

B. Machine specifications

Power Requirements	Supplied by the Finisher
Dimensions	114 mm (W) x 461 mm (D) x 136 mm (H) 4.5 inch (W) x 18.25 inch (D) x 5.25 inch (H)
Weight	Approx. 1.9 kg (4.25 lbs) or less

C. Operating environment

- Conforms to the operating environment of the main unit.

1.3 OT-601

A. Type

Name	Output Tray OT-601
Installation	Fixed to the Finisher
Mode	Non sort, sort, group, and sort stable
Number of Bins	1 bin
Document Alignment	Center

B. Paper Type

<table>
<tr><th>Mode</th><th>Size</th><th colspan="2">Type</th><th>Capacity</th></tr>
<tr><td rowspan="8">Non sort</td><td rowspan="8">A6R to A3
5.5 to 11 x 17
Max.
297 mm x 431.8 mm
11.75 x 17 inch
Min.
100 mm x 139.7 mm
4 x 5.5 inch</td><td colspan="2">Plain Paper
(56 to 90 g/m^2,15 to 24 lb)</td><td>200 sheets
(up to a height of 24 mm)</td></tr>
<tr><td rowspan="7">Special</td><td>OHP transparencies</td><td rowspan="7">20 sheets
(up to a height of 24 mm)</td></tr>
<tr><td>Thick paper
(91 to 210 g/m^2,
24.25 to 55.75 lb)</td></tr>
<tr><td>Envelope</td></tr>
<tr><td>Label</td></tr>
<tr><td>Letterhead</td></tr>
<tr><td>Translucent paper</td></tr>
<tr><td>Governmentstandard postcards</td></tr>
<tr><td>Sort / group</td><td rowspan="2">A6R to A3
5.5 to 11 x 17
Max.
297 mm x 431.8 mm
11.75 x 17 inch
Min.
182 mm x 139.7 mm
7.25 x 5.5 inch</td><td colspan="2" rowspan="2">Plain Paper
(56 to 90 g/m^2,15 to 24 lb)</td><td>200 sheets
(up to a height of 24 mm)</td></tr>
<tr><td>Sort stable</td><td>200 sheets or 20 copies
(up to a height of 24 mm)</td></tr>
</table>

C. Machine specifications

Dimensions	282 mm (W) x 368 mm (D) x 57 mm (H) 11 inch (W) x 14.5 inch (D) x 2.25 inch (H)
Weight	0.7 kg (1.5 lb)

D. Operating environment

- Conforms to the operating environment of the main unit.

NOTE

How product names appear in the document

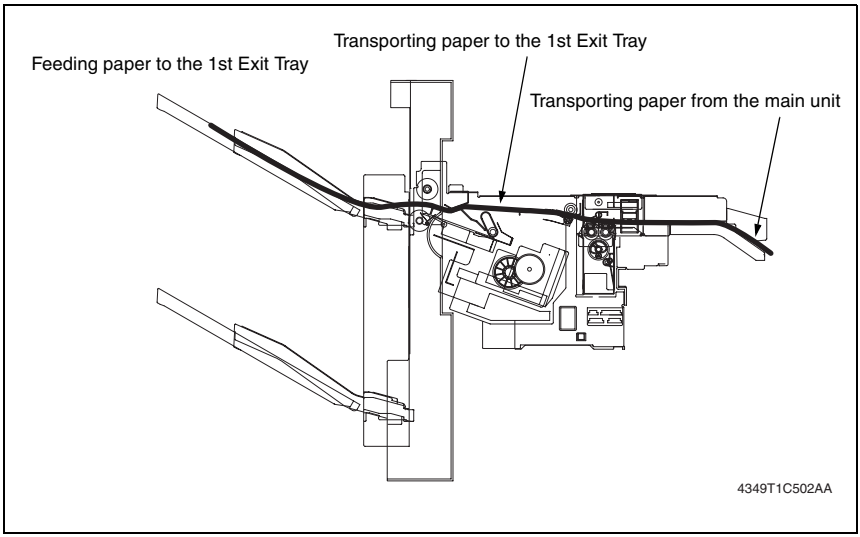
- FS-508: Finisher
- PU-501: Punch Unit
- OT-601: Output Tray

NOTE

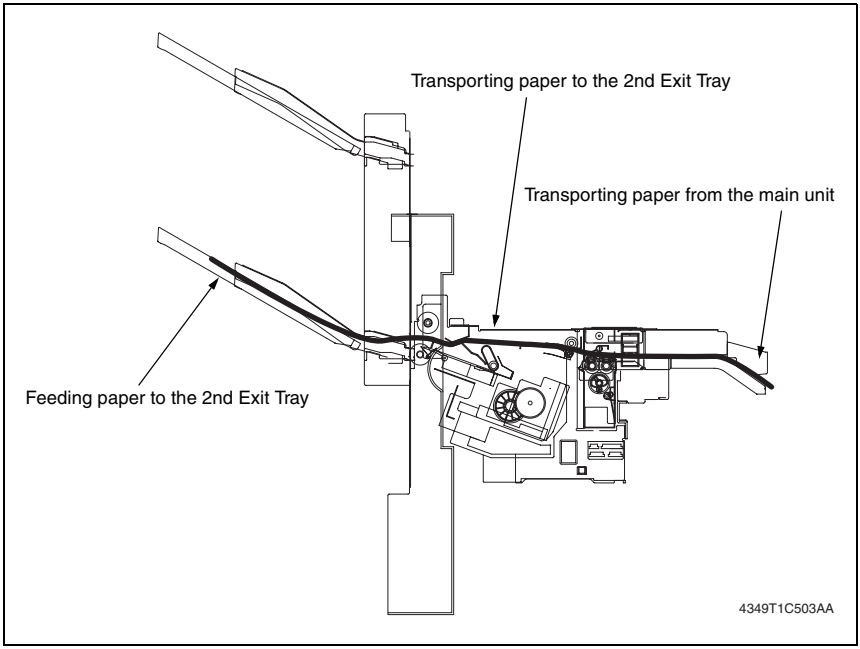
- **These specifications are subject to change without notice.**

2. Paper Feed Path

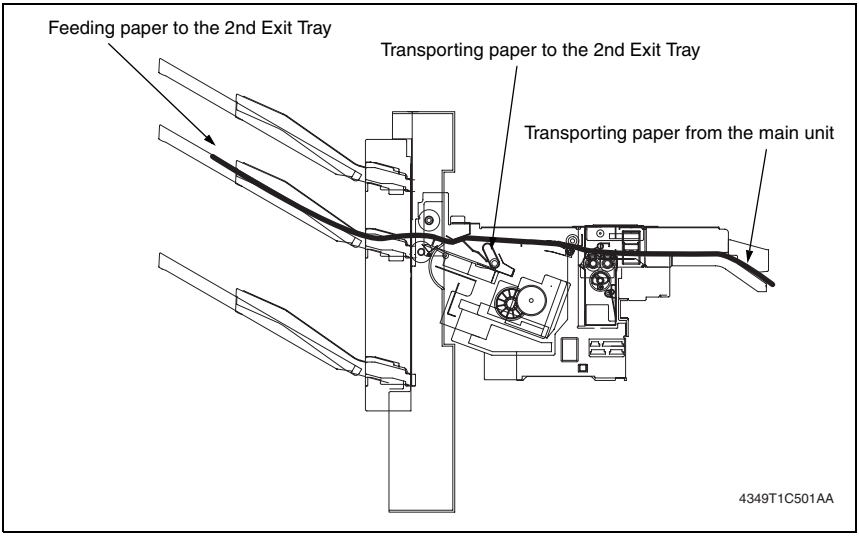
2.1 Feeding Paper to the 1st Exit Tray


Transporting paper to the 1st Exit Tray
Feeding paper to the 1st Exit Tray
Transporting paper from the main unit
4349T1C502AA

2.2 Feeding Paper to the 2nd Exit Tray

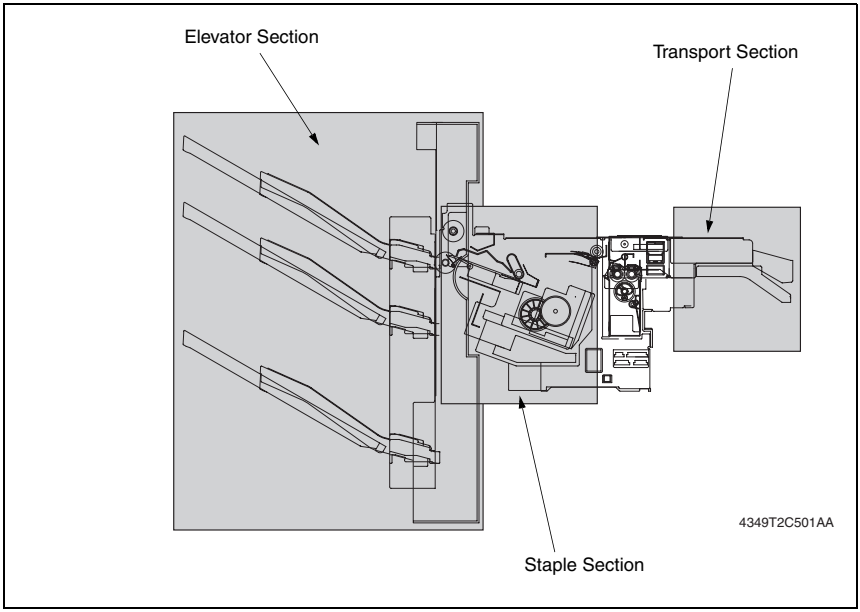

Transporting paper to the 2nd Exit Tray
Transporting paper from the main unit
Feeding paper to the 2nd Exit Tray
4349T1C503AA

2.3 Feeding Paper to the 2nd Exit Tray (When OT-601 is Mounted)

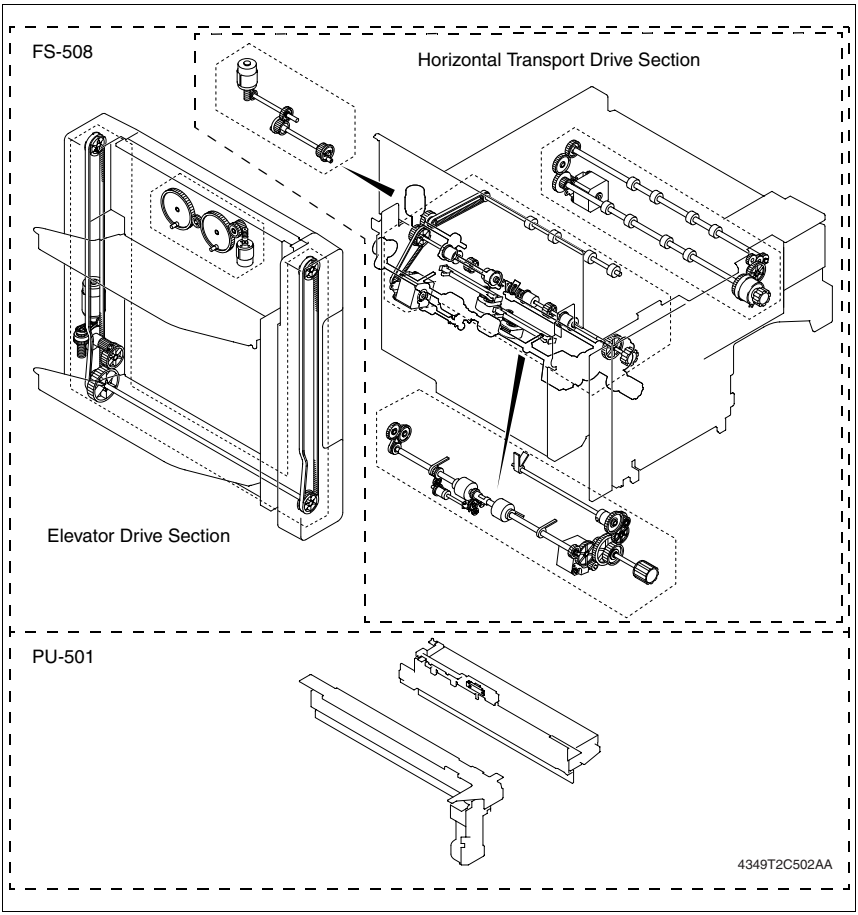

Feeding paper to the 2nd Exit Tray
Transporting paper to the 2nd Exit Tray
Transporting paper from the main unit
4349T1C501AA

Composition/Operation

3. Composition



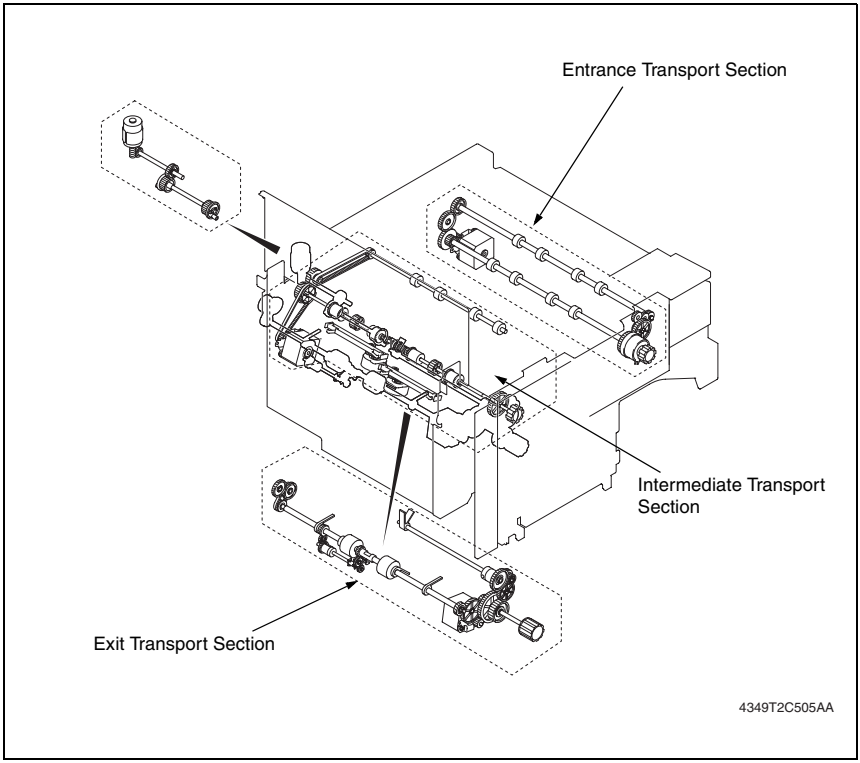
4. Drive


FS-508
Horizontal Transport Drive Section
Elevator Drive Section
PU-501
4349T2C502AA

5. Operations

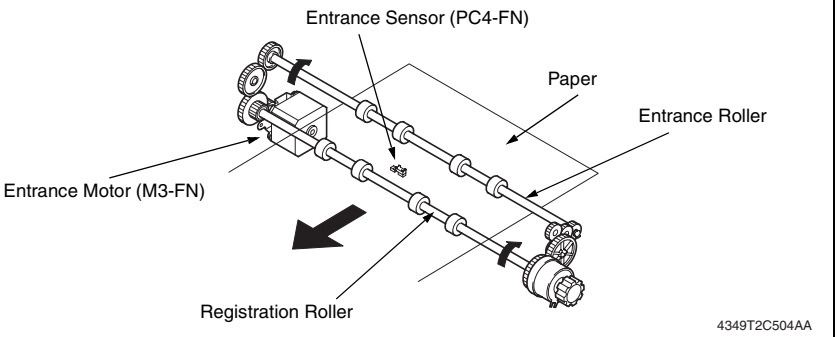
5.1 Transport Section

- The Transport Section is divided into the entrance transport section, intermediate transport section, and the exit transport section. It controls to transport the paper fed from the main unit, stop the paper at the punching and creasing positions, and drive the paper for feeding into the exit section.



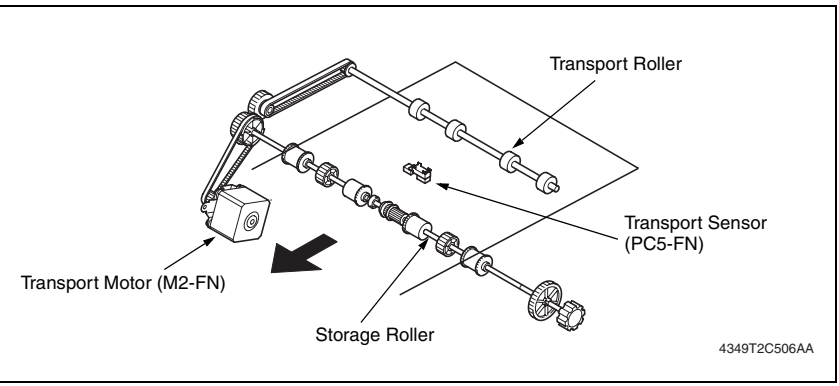
5.1.1 Entrance/Transport section

- The paper fed from the main unit is transported to the intermediate transport section.
- The Entrance Motor (M3-FN) provides the drive for transporting the paper.
- When the Entrance Motor (M3-FN) is energized, the Entrance Roller and Registration Roller are driven to rotate.
- The Entrance Sensor (PC4-FN) detects the paper in the transport section.



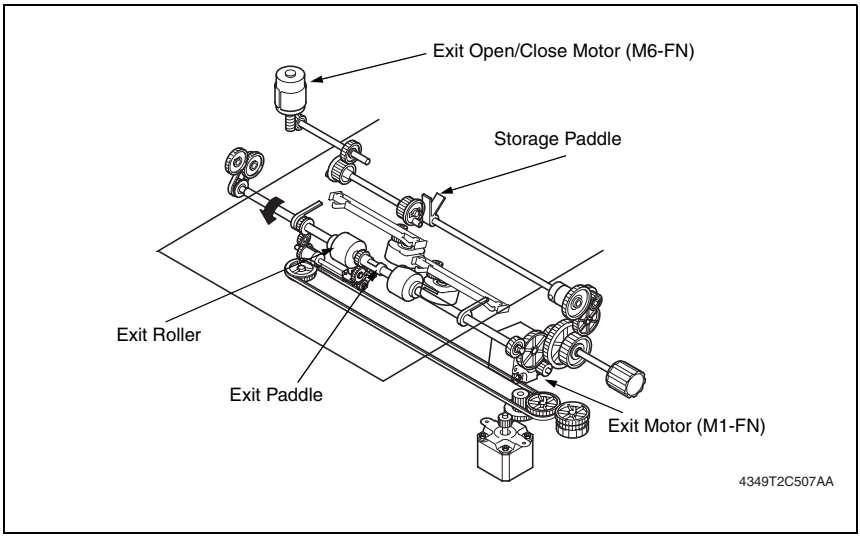
5.1.2 Intermediate Transport Section

- The paper transported from the entrance transport section is brought to a stop at the punching and creasing position.
- The paper is also transported to the exit transport section.
- Drive for the intermediate transport section is provided by the Transport Motor. Drive of the Transport Roller and Storage Roller is controlled.
- The Transport Sensor (PC5-FN) detects paper in the intermediate transport section.



5.1.3 Exit Transport Section

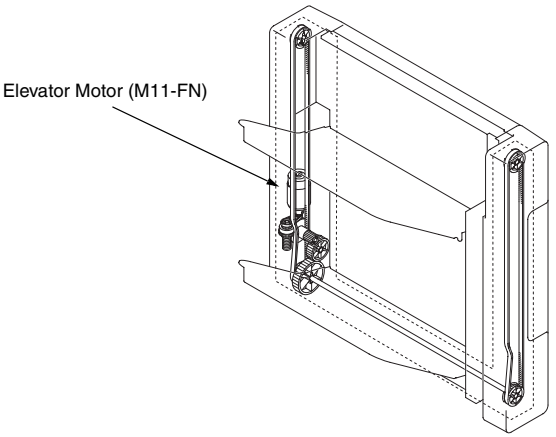
- The paper is transported onto each of the exit trays.
- The Exit Motor provides drive for the Exit Roller, Storage Paddle, and Exit Paddle.



5.2 Elevator Section

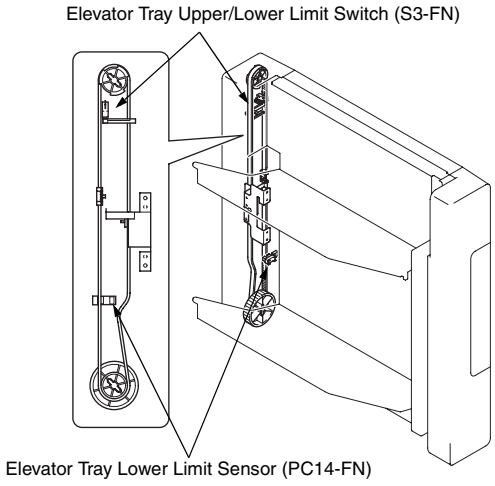
5.2.1 Elevator mechanism

- The elevator mechanism is operated to select a specific exit port, thereby feeding the paper out onto a specific exit tray.



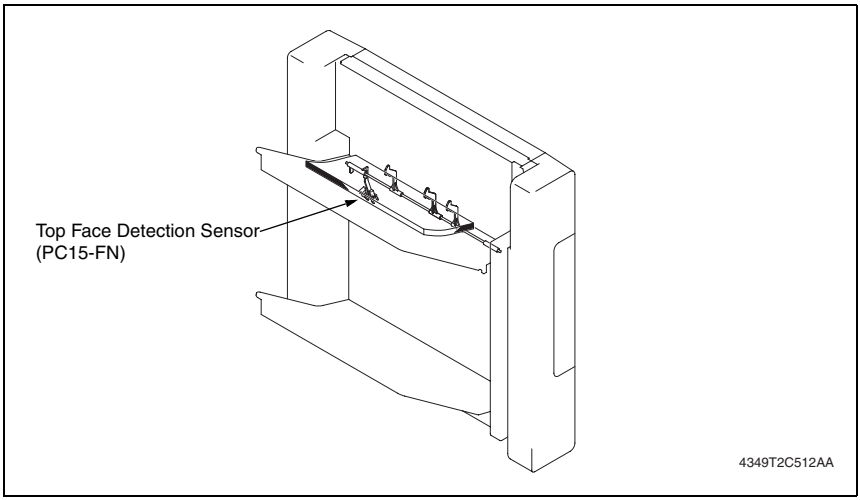
5.2.2 Elevator Tray Ascent/Descent

- The Elevator Tray is moved up or down by the Elevator Motor that turns forward or backward to drive the front and rear belts.
- The Elevator Tray Lower Limit Sensor detects the Elevator Tray at its lower limit position.
- The Elevator Tray Upper/Lower Limit Switch is provided for protection when a malfunction occurs in the finisher.



5.2.3 Tray Position Detection Mechanism

- The tray moves up or down according to the amount of paper fed onto it.
- If the Elevator Tray Upper Limit Sensor is activated when a sheet of paper is fed onto the tray, the Elevator Tray is temporarily lowered until the Elevator Tray Upper Limit Sensor is deactivated and then the tray is raised to a level, at which the Elevator Tray.
- Upper Limit Sensor is activated again. This is done when each time a sheet of paper is fed onto the tray to keep the same height at all times for the Elevator Tray Upper Limit Sensor of the paper on the tray.

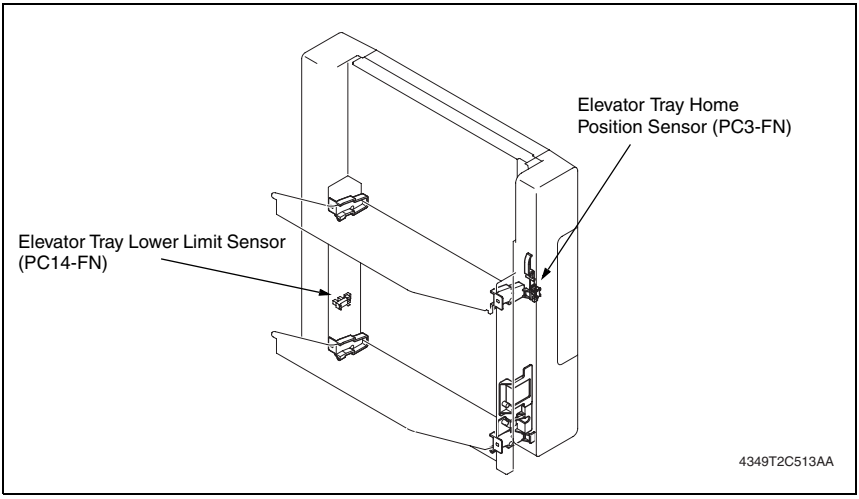


A. Tray Position Detection

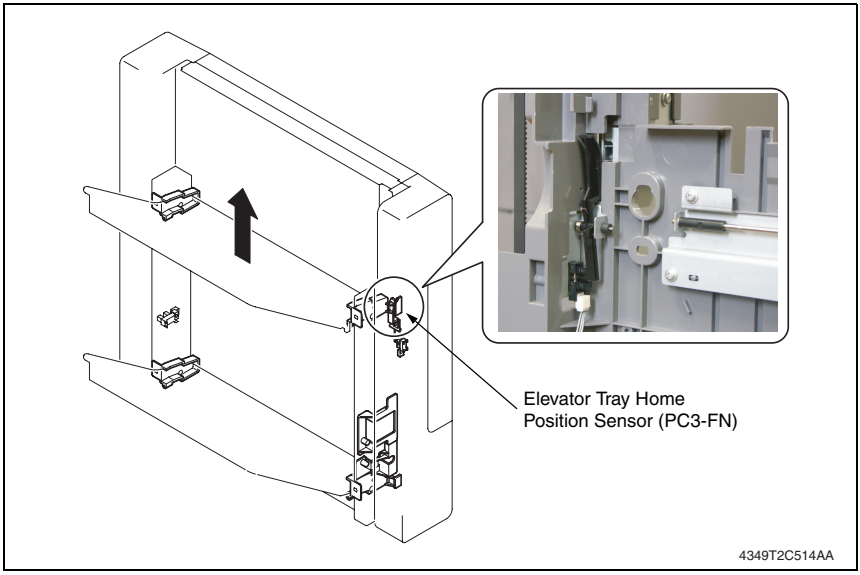
- Tray position detection is controlled according to the number of times the Elevator Tray Home Position Sensor is activated after the Elevator Tray Lower Limit Sensor has been activated.

(1) Tray position detection operation

1. During the initial operation sequence, the Elevator Tray is subjected to a descent motion until the Elevator Tray Lower Limit Sensor (PC14-FN) is activated.



2. After the Elevator Tray Lower Limit Sensor (PC14-FN) has been activated, the Elevator Tray is subjected to an ascent motion.
3. When the Elevator Tray Home Position Sensor (PC3-FN) is activated a first time after the ascent motion of the Elevator Tray has been started, it is determined that the Elevator Tray is now located at the exit port for the 1st Exit Tray.



4. When the Elevator Tray Home Position Sensor (PC3-FN) is activated a second time after the ascent motion of the Elevator Tray has been started, it is determined that the Elevator Tray is now located at the exit port for the 2nd Exit Tray.
5. Drive is stopped when the Elevator Tray Upper Limit Sensor is activated with the position sensor of the target tray in the activated position.

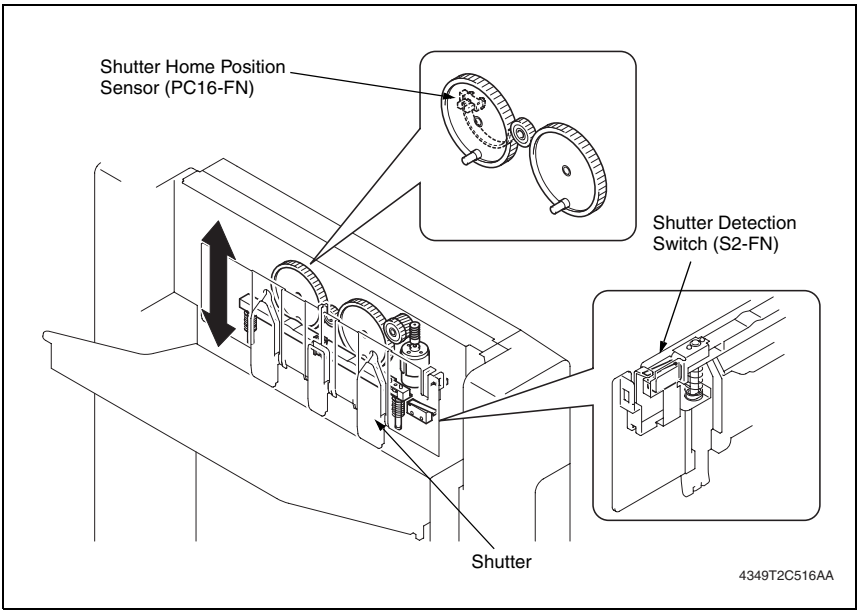
* If an additional AK-1 tray is installed, the additional tray is at the exit port when the position sensor is activated twice and the 2nd Tray is at the exit port when the position sensor is activated three times.

B. Paper Full Detection

- When the Elevator Tray Home Position Sensor changes from the activated to deactivated state with the Top Face Detection Sensor in the activated state, a paper full condition is detected and the corresponding message will appear on the control panel.
- To protect the Exit Roller from the Elevator Tray in motion, the Shutter is opened or closed while the Elevator Tray is moving.
- The Elevator Motor (M11-FN) provides the drive for the Elevator Tray.
- The Shutter Opening Motor (M12-FN) opens or closes the exit port.

5.2.4 Shutter Open/Close Mechanism

- There is a shutter provided at the exit area of the finisher. The Shutter is normally in the raised position and the exit port is open. When the trays are moving, however, the Shutter is closed to ensure operator safety.
- The Shutter is opened or closed by the Shutter Opening Motor that turns a gear train for raising or lowering the Shutter.
- The Shutter Home Position Sensor detects the position of the gear, thereby determining the position of the Shutter.
- The Shutter Detection Switch detects that the Shutter is in the closed position.



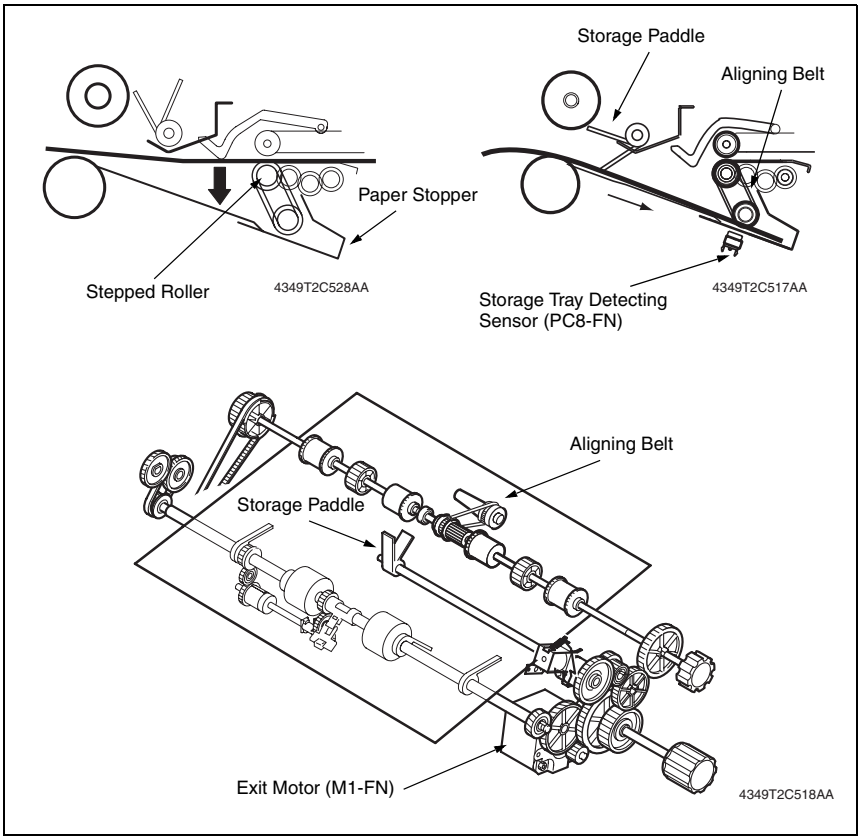
5.3 Paper aligning section

5.3.1 Paper aligning mechanism (sub scan direction)

- Sheets of paper are aligned properly and stapled together inside the transport section before being fed out onto the corresponding exit tray.
- In the Sort, Group Copy, Staple, or Center Crease/Center Staple mode, each copy set is stored in the Storage Tray with the Upper Exit Roller separated from the Lower Exit Roller.
- The Storage Tray Detecting Sensor detects paper in the Storage Tray.
- The Storage Paddle and Aligning Belt are driven when the Exit Motor is rotated in reverse.

A. Operation

1. The paper fed out from the main unit is held downward by the drop lever and dropped down into the Storage Tray by the stepped roller.
2. The paper dropped into the Storage Tray is pressed against the stopper by the paddle and aligning belt so that it is aligned properly in the sub scan direction.

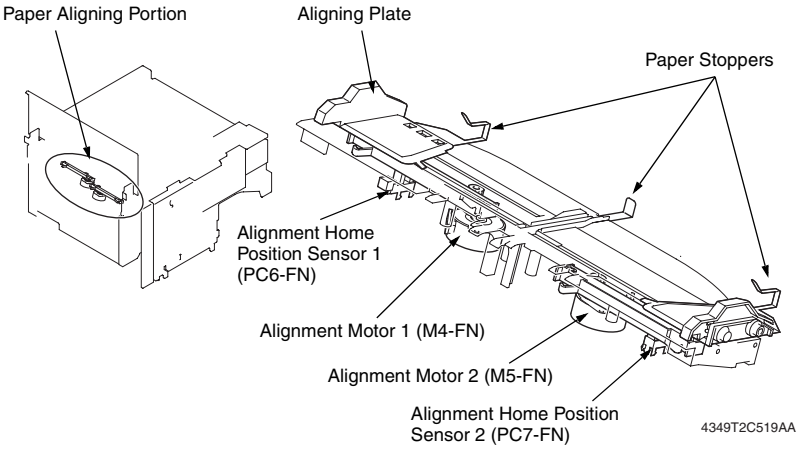


5.3.2 Paper aligning mechanism (main scan direction)

- Aligning Plates are moved and the Paddle is rotated so as to align the paper at the stapling position.
- The paper in the Storage Tray is aligned in the main scan direction by two Alignment Motors and aligning plates.

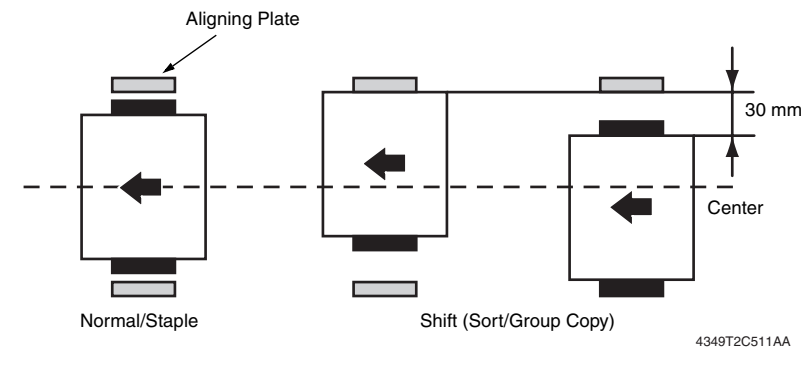
A. Aligning plates

- The aligning plates are moved to the front or rear in accordance with the paper size.
- The Alignment Home Position Sensor controls the position of each aligning plate.



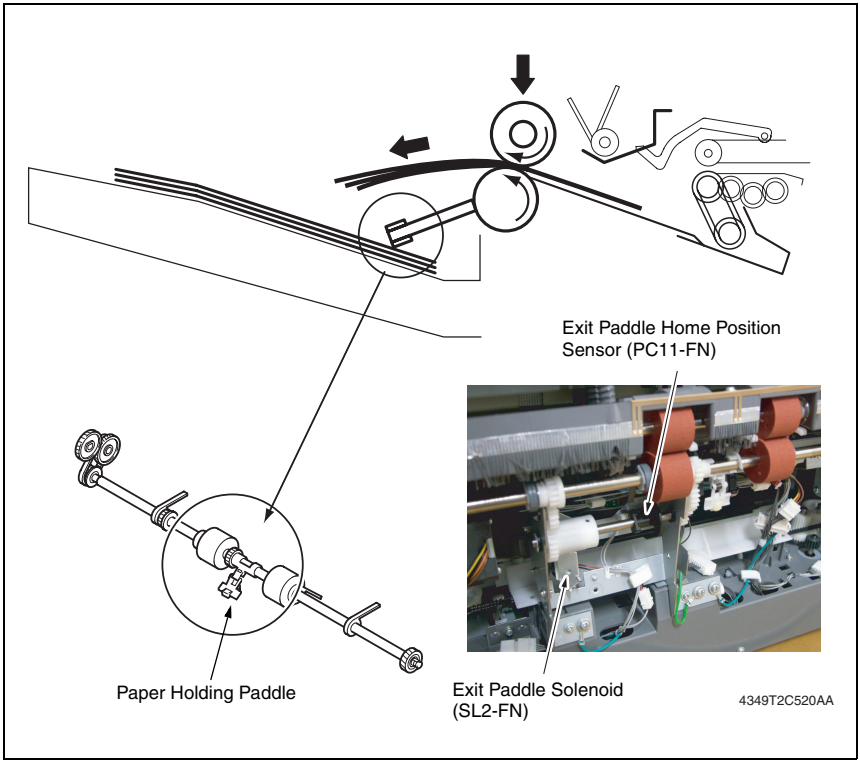
B. Paper aligning sequence

- In normal copy and staple mode, the paper is fed into the tray at its center position.
- If no stapling is involved in the Sort or Group Copy mode, the aligning plate shifts 15 mm to the front or rear from the center. This stacks copy sets/stacks in a saw tooth manner, each being offset by about 30 mm with respect to the others.
  This shifting motion is not performed when sets/stacks are fed into the mail bins or the saddle unit.



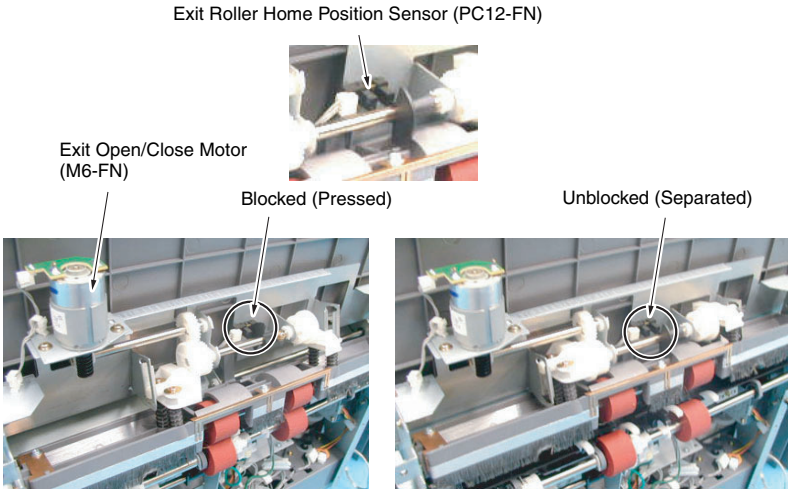
5.3.3 Exit mechanism

- There is a paper holding paddle provided at the Exit Roller for preventing the copy set/stack on the exit tray from being pushed by a new copy set/stack that is being fed out.
- The subsequent copy set/stack is fed out with the copy sets/stacks previously resident on the tray being held down by the paper holding paddle.
- The home sensor, spring clutch, and solenoid control the retracted position and paper holding position of the paper holding paddle.



A. Upper exit roller up/down motion mechanism

- The Exit Open/Close Motor moves the Upper Exit Roller away from the Lower Exit Roller or presses the Upper Exit Roller up against the Lower Exit Roller.
- When one copy set/stack is stored in the Storage Tray, the Upper Exit Roller is moved downward to be pressed up against the Lower Exit Roller and the two rollers feed the copy set/stack out onto the exit tray.
- The Exit Roller Home Position Sensor detects the position of the Upper Exit Roller, whether it is in the raised or lowered position.



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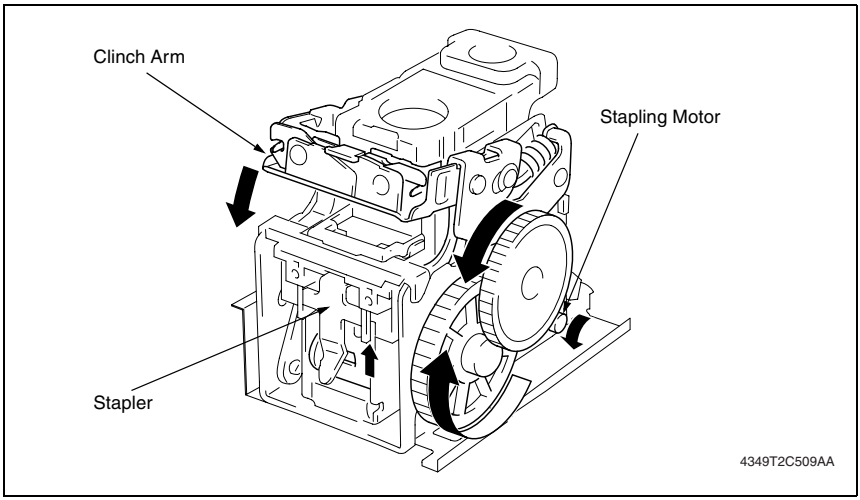
5.4 Stapling

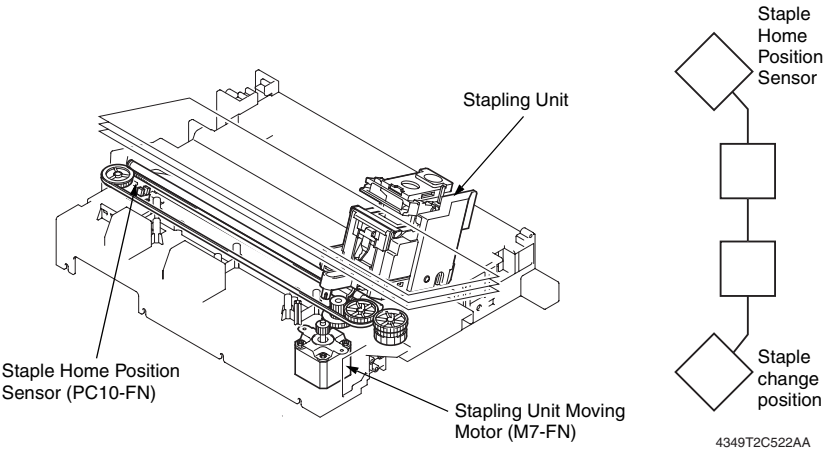
5.4.1 Stapling mechanism

- Stapling is performed by the Stapling Unit.
- When the Stapling Motor is rotated, the Clinch Arm lowers. The Stapler thereafter goes up to drive a staple in the paper.
- Five different types of stapling are available: parallel front one point, parallel rear one point, slant front one point, slant rear one point and parallel two points.



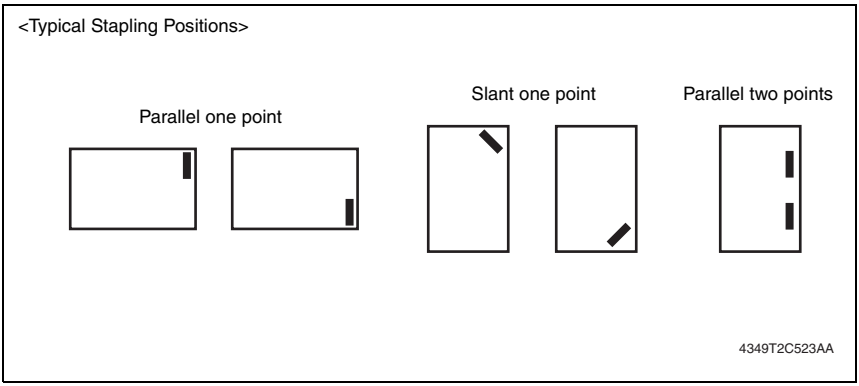
5.4.2 Stapling Unit moving mechanism

- The Stapling Unit is moved by the Stapling Unit Moving Motor.
- The Stapling Unit Moving Motor drives the belt so that the Stapling Unit is moved to the corresponding stapling position.
- The stapling stop position is controlled by the period of time during which the Stapling Unit Moving Motor is kept energized, as counted from the time when the Staple Home Position Sensor has been activated.



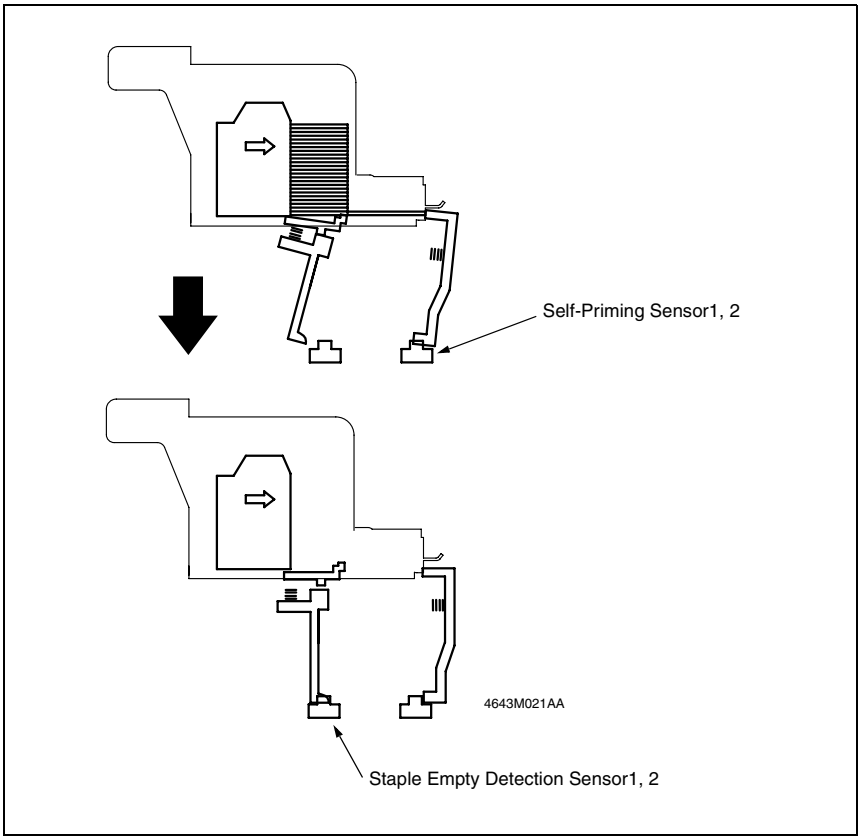
5.4.3 Stapling Position

- A single stapling unit is moved to perform 2-point stapling.



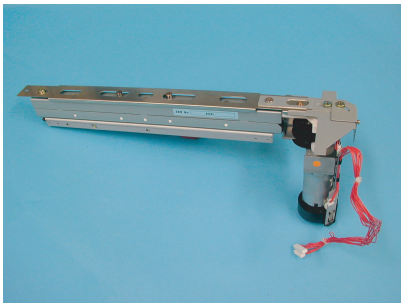
5.4.4 Staple sheet empty detection

- Staple Empty Detection Sensor 1, 2 detect whether or not there is a staple sheet still left.
- When the number of staples left in the staple cartridge becomes about 20, a staple sheet empty condition results, causing a corresponding empty message to appear on the control panel.
- When the empty condition is detected, the corresponding empty indication is given on the control panel. At the same time, the Stapling Unit moves to the front.
- When a new staple cartridge is loaded, the stapling motor is energized until the self-priming sensor detects a staple, which results in the staple to be fed up to the stapling position.



6. Punch Kit (PK-6)

6.1 Composition



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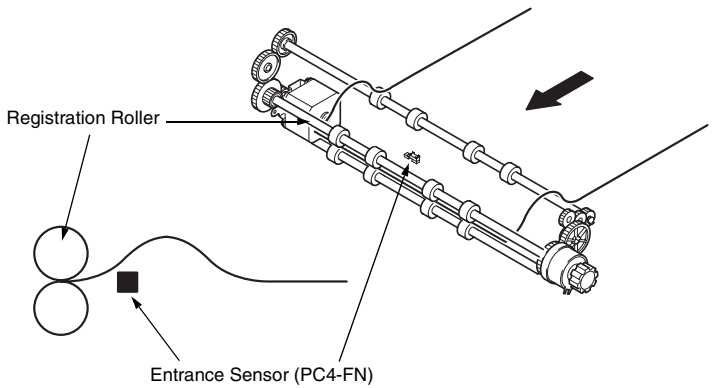
6.2 Operation

6.2.1 Skew correction mechanism

- For punch and center crease operations, a loop is formed in the paper at the Registration Roller to correct skew.
- The Entrance Sensor detects the leading edge of the paper and the Registration Roller forms a loop in the paper.
- The Registration Clutch (CL1-FN) is then energized after a given period of time after the Entrance Sensor is activated by the leading edge of the paper, this causes the Registration Roller to start turning.



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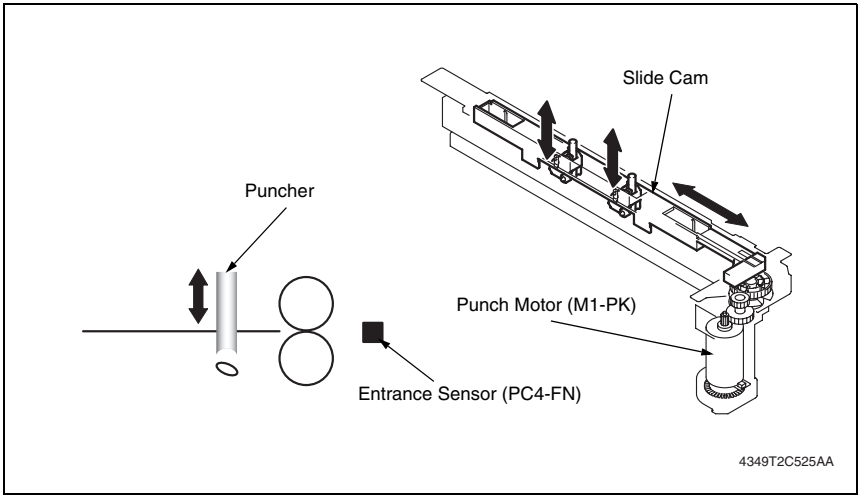
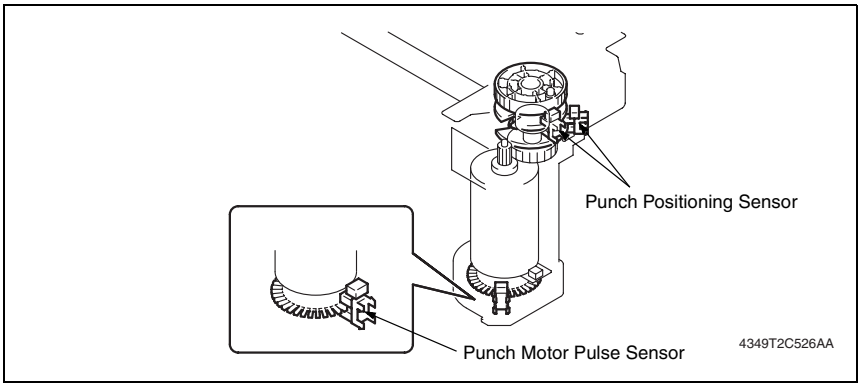
6.2.2 Punch mechanism

- After a given period of time after the Entrance Sensor has detected the trailing edge of the paper, the Punch Motor is deenergized and a punch hole operation is made at the trailing edge portion in each sheet of paper.
- Punch holes are made when the slide cam makes a reciprocating motion, as driven by the drive cam which is rotated by the Punch Motor (M1-PK) provided in the punch unit.



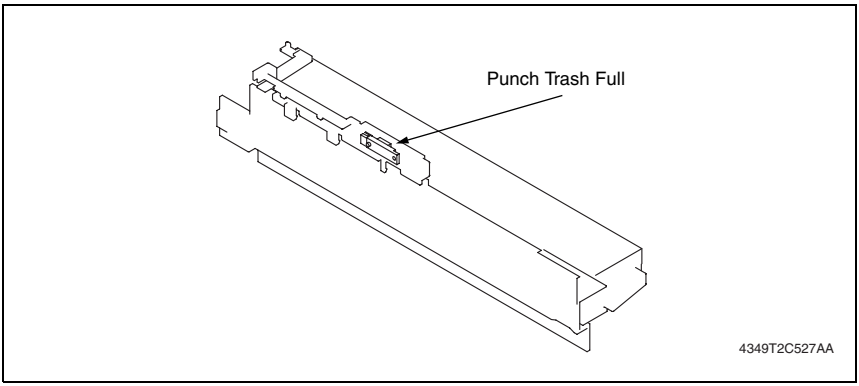
6.2.3 Punch status detection

- The punch status is detected by using the Punch Positioning Sensors and the Punch Motor Pulse Sensor (PC2-PK).



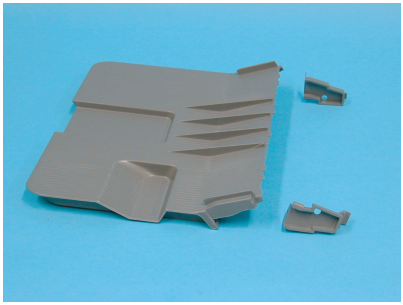
6.2.4 Punch Trash Box full detection mechanism

- Punch trash produced as a result of punching operation is stored in the Punch Trash Box.
- The Punch Trash Box is provided with the Punch Trash Full (PC1-PK). When a punch waste is detected, the corresponding message is displayed on the control panel.
- The Punch Trash Full sensor (PC1-PK) is a reflector type sensor that detects height of the punch trash.
- The Punch Trash Full sensor (PC1-PK) also detects whether a Punch Trash Box is loaded.



7. Output Tray (OT-601)

7.1 Composition



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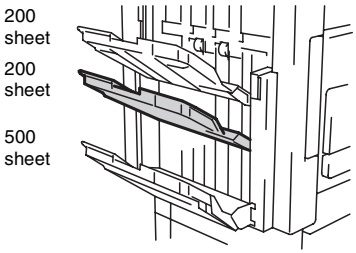
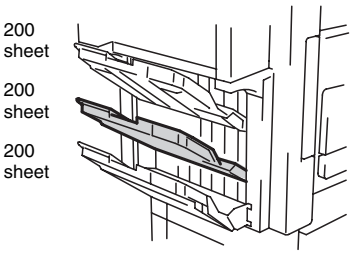
7.2 Operation

7.2.1 Overview

- Mounting the optional Output Tray (OT-601) provides a total of three exit trays.
- The Output Tray is attached at different positions depending on whether options SD-502/MT-501 are mounted or not.
  The capacity of each of the different trays depends on the specific positions they are attached.
- When the short-circuit connector shipped with the Output Tray is mounted, the machine determines that the Output Tray has been mounted.



FS-508 Only



When MT-502/SD-502 is Installed

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KONICA MINOLTA

SERVICE MANUAL

THEORY OF OPERATION

MT-501

2005.08
KONICA MINOLTA BUSINESS TECHNOLOGIES, INC. Ver. 1.0

Revision history

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2005/08	1.0	—	Issue of the first edition
Date	Service manual Ver.	Revision mark	Descriptions of revision

CONTENTS

MT-501

Outline

1. Product specifications 1
2. Paper Path 2

Composition/Operation

3. Composition 3
4. Drive 4
5. Operations 5
5.1 Paper transport mechanism 5
5.2 Paper path selection mechanism 6
5.3 Paper detection 7

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Outline

1. Product specifications

A. Type

Name	Mailbin Kit
Installation	Install at the top section of the Finisher Elevator Tray.
Number of Bins	4 bins
Number of Sheets Stored per Bin	125 sheets (80 g/m^2, 52.75 lb)
Storable Paper	Plain Paper (56 to 90 g/m^2, 15 to 24 lb)
Storable Paper Size	A5R, B5, A4, 5.5R, 8.5 x 11

B. Machine specifications

Power Requirements	DC 24 V (supplied from the Finisher) DC 5 V (generated inside the Mail Bin)
Dimensions	624 mm (W) x 503 mm (D) x 390 mm (H) 24.5 inch (W) x 19.75 inch (D) x 15.25 inch (H)
Weight	8 kg (17.75 lb)

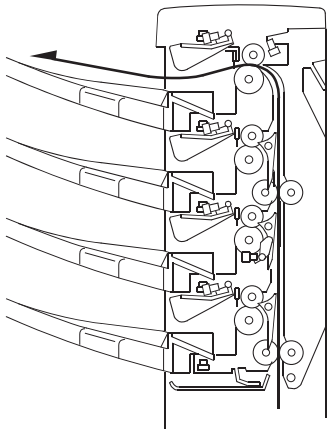
C. Operating environment

- Conforms to the operating environment of the main unit.

NOTE

- **These specifications are subject to change without notice.**

2. Paper Path



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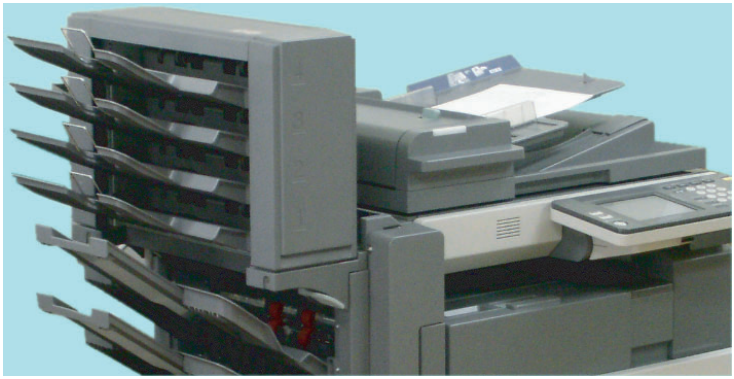
Composition/Operation

3. Composition



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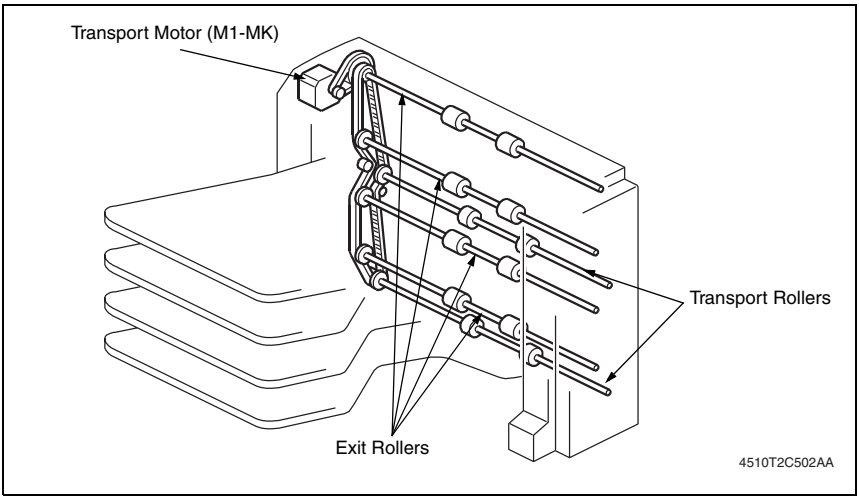
4. Drive


Transport Motor (M1-MK)
Transport Rollers
Exit Rollers
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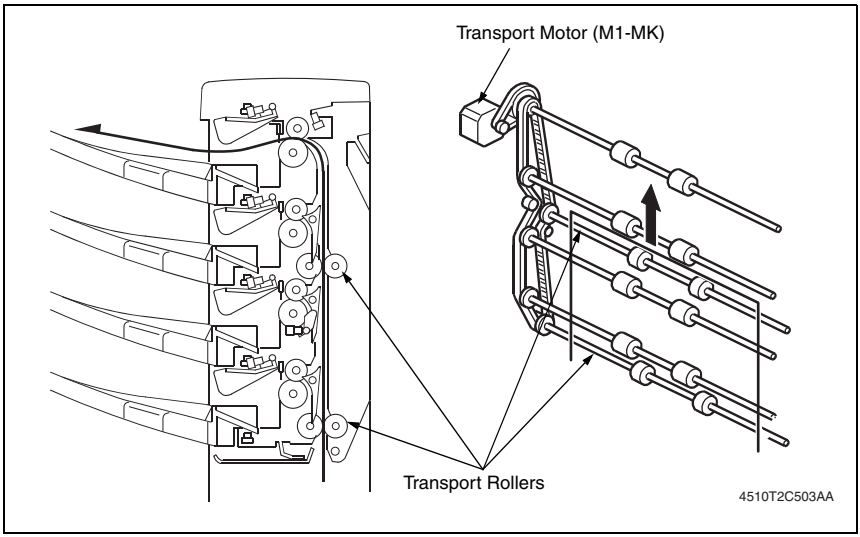
5. Operations

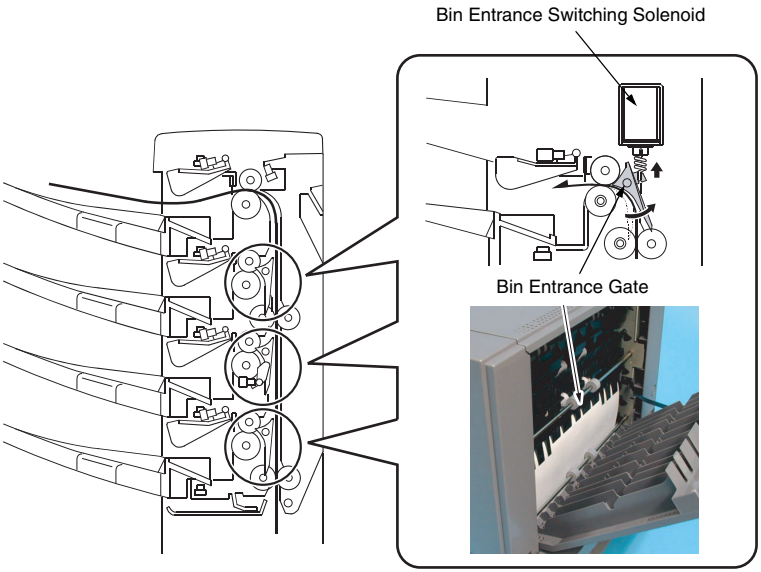
5.1 Paper transport mechanism

- When the Mailbin is selected as the exit source, paper is fed off from the Finisher (FS-508) and toward the Mailbin.
- Drive for the Transport Rollers of the Mailbin is transmitted from the Transport Motor (M1-MK) by way of a belt.
- As each of the Transport Rollers is driven, paper fed off from the Finisher is transported into the Mailbin.



5.2 Paper path selection mechanism

- The Bin Entrance Switching Solenoids are energized or deenergized to direct paper fed from the Finisher into a specific tray.
- There are three Bin Entrance Switching Solenoids provided that will be energized or deenergized to operate the corresponding Bin Entrance Gate, thereby selecting a specific paper path into a specific tray.



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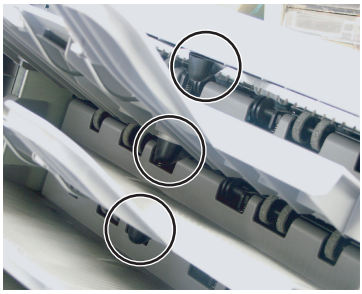
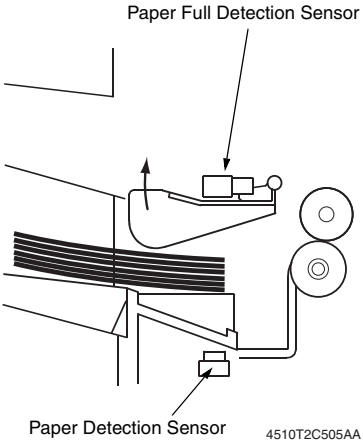
5.3 Paper detection

- The paper detection sensor detects any sheet of paper that is fed into the tray, causing the ADF LED to light up green steadily to inform the user that a sheet of paper has been fed into the tray.
- As the paper stacks up and eventually deactivates the Paper Full Detecting Sensor, at which time a paper full condition is detected.





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KONICA MINOLTA

SERVICE MANUAL

THEORY OF OPERATION

SD-502

2005.08

KONICA MINOLTA BUSINESS TECHNOLOGIES, INC. Ver. 1.0

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  The revision marks for Ver. 2.0 are left as they are.

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Date	Service manual Ver.	Revision mark	Descriptions of revision

CONTENTS

SD-502

Outline

1. Product specifications 1
2. Paper Path 2

Composition/Operation

3. Composition 3
4. Drive 4
5. Operations 5
5.1 Paper transport mechanism 5
5.2 Exit roller pressure/release 6
5.2.1 Pressure/release mechanism 6
5.2.2 Operation 7
5.3 Stapling mechanism 8
5.4 Layable guide 9
5.4.1 Layable guide mechanism 9
5.4.2 Operation timing 9
5.5 Center creasing mechanism 10
5.5.1 Operation 11
5.6 In & out guide 12
5.6.1 In & out guide mechanism 12
5.7 Tray paper detection 13

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Outline

1. Product specifications

A. Type

Name	Saddle Sticher SD-502
Type	Built into the Finisher
Installation	Screwed to the Finisher
Document Alignment	Center
Stapling Function	Center parallel two points No. of sheets to be stapled together: 2 to 15

B. Paper type

Type	Plain Paper	56 g/m^2 to 90 g/m^2 15 to 24 lb
Size	B5R to A3	
Capacity	200 sheets or 20 copies	

C. Machine specifications

Power Requirements	DC 24 V (supplied from the Finisher) DC 5 V
Max. Power Consumption	9.5 W or less
Dimensions	445 mm (W) x 203 mm (D) x 478 mm (H) 17.5 inch (W) x 8 inch (D) x 18.75 inch (H)
Weight	9.3 kg (20.5 lb)

D. Operating environment

- Conforms to the operating environment of the main unit.

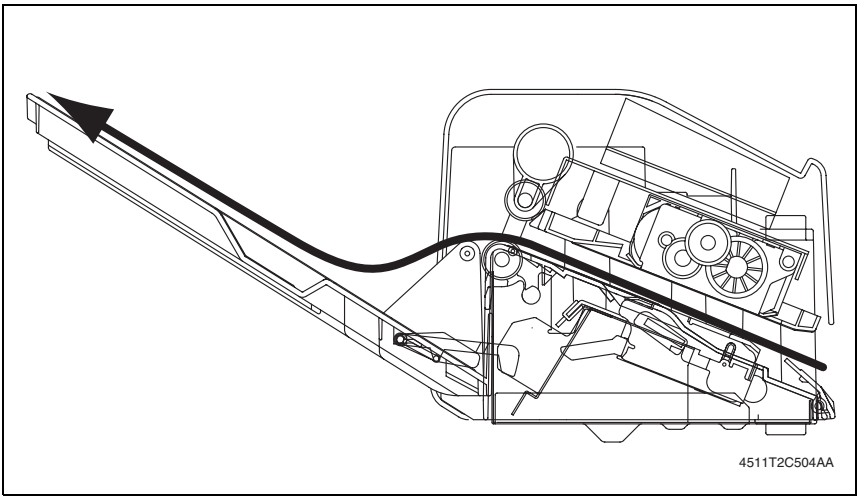
E. Consumables

- Staples 2000 (MS-2C) x 2

NOTE

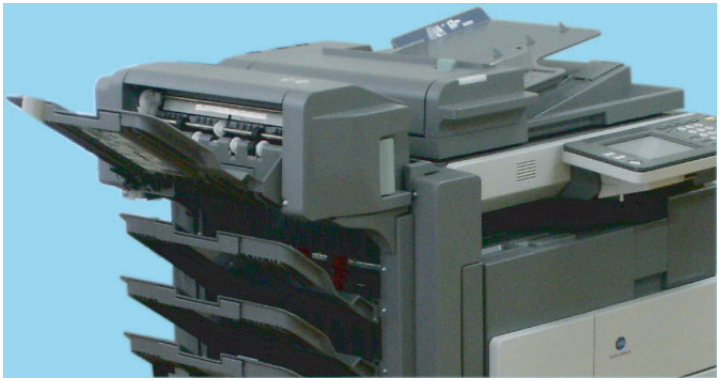
- **These specifications are subject to change without notice.**

2. Paper Path



Composition/Operation

3. Composition



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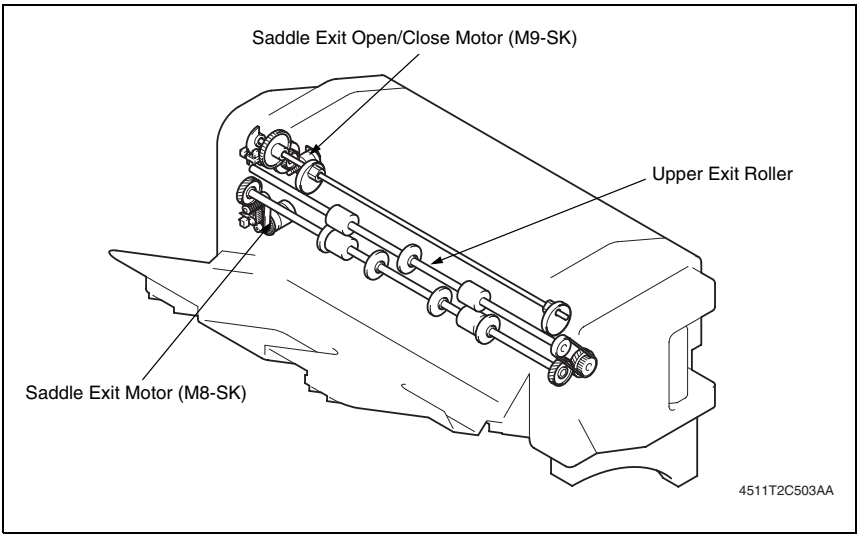
4. Drive


Saddle Exit Open/Close Motor (M9-SK)
Upper Exit Roller
Saddle Exit Motor (M8-SK)
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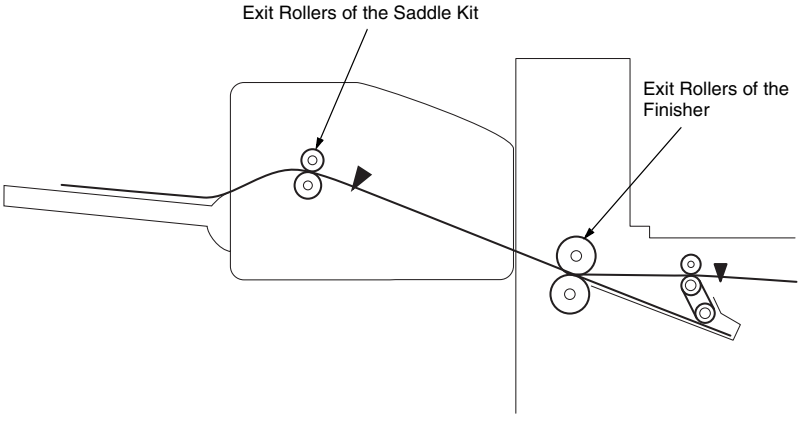
5. Operations

5.1 Paper transport mechanism

- Paper is transported by the Exit Rollers of the Finisher and Exit Rollers of the Saddle Kit.
- The Saddle Exit Motor provides the drive for the Exit Rollers of the Saddle Kit.
- If a center stapling operation is made with a copy set/stack (that has been creased at the center or is to be stapled at the center) stored in the Storage Tray, the copy set/stack is transported to the center stapling position, through a pulse control of the Exit Roller of the finisher.
- The copy set/stack is thereafter fed out by the Exit Rollers of the Saddle Kit.



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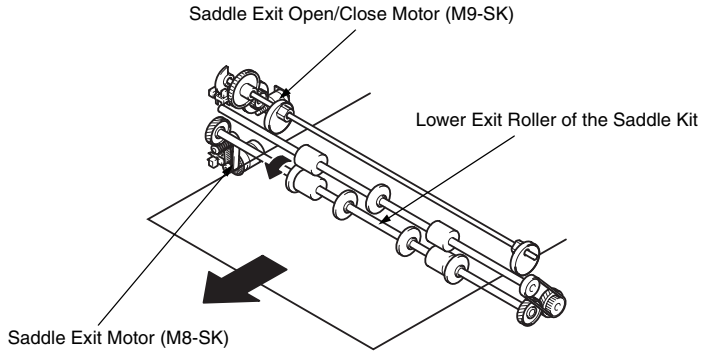

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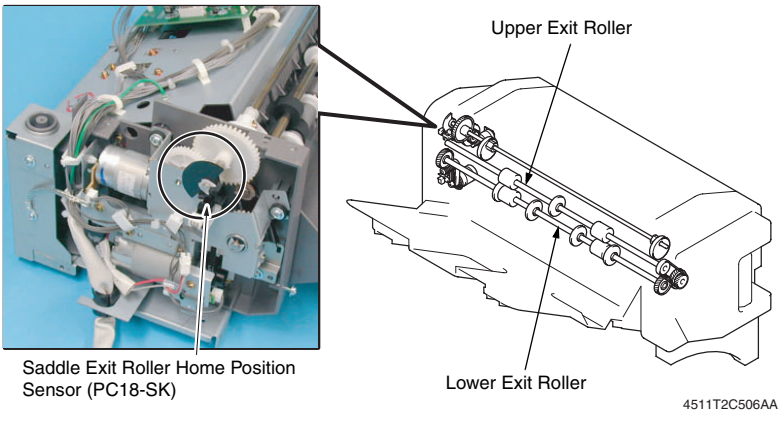
5.2 Exit roller pressure/release

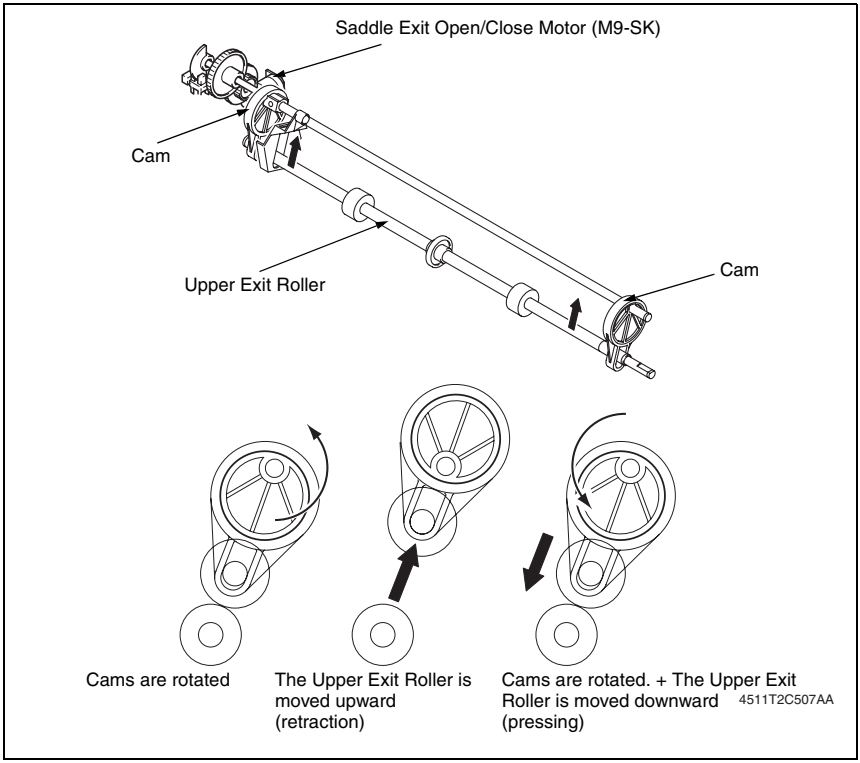
5.2.1 Pressure/release mechanism

- The Upper Exit Roller is moved away from, or pressed up against, the Lower Exit Roller, when the paper is fed out as a copy set/stack.
- The Saddle Exit Roller Home Position Sensor is used to control the pressure/release position of the Upper Exit Roller.



5.2.2 Operation

1. The Upper Exit Roller is moved up or down by the cams which are driven by the Saddle Exit Open/Close Motor.
2. When the copy set/stack moves past the Exit Roller, the motor is energized to press the Upper Exit Roller up against the Lower Exit Roller, thereby feeding the copy set/stack out into the tray.


Saddle Exit Open/Close Motor (M9-SK)
Cam
Upper Exit Roller
Cam
Cams are rotated
The Upper Exit Roller is moved upward (retraction)
Cams are rotated. + The Upper Exit Roller is moved downward (pressing)
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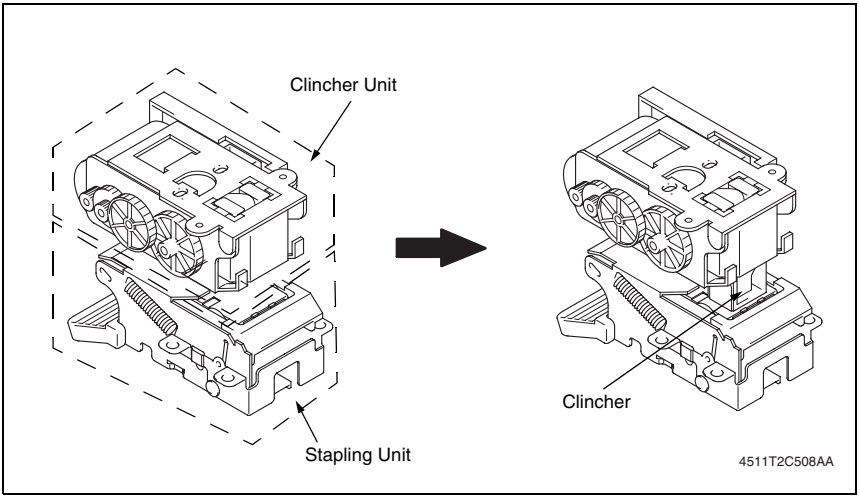
5.3 Stapling mechanism

- There are two The Stapling Units in the Saddle Kit, each being fixed to a specific position.
- Since the unit is for center stapling only, it is made up of the upper clincher portion and the lower stapling portion. The copy set/stack moves through the space between the upper and lower portions of the staplers.
- When stapling, the clincher portion moves downward to perform the stapling operation.

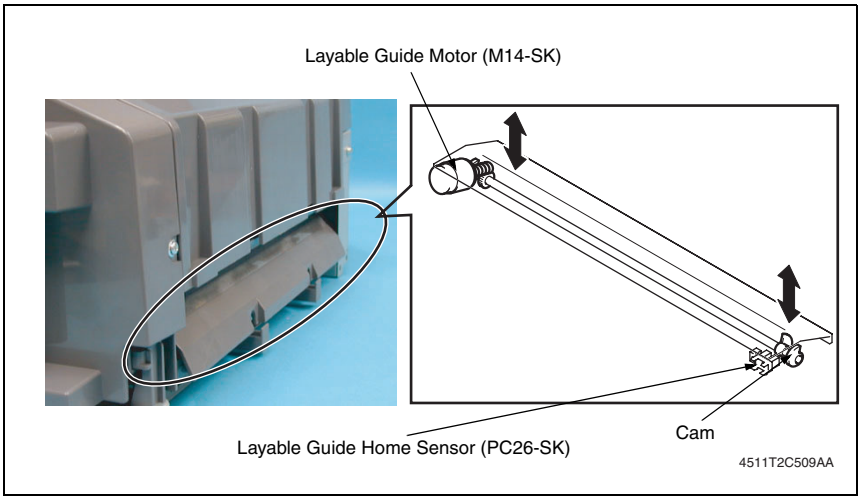


5.4 Layable guide

- The Movable Guide is used to guide the leading edge of the first sheet of paper when the first sheet of paper is stored, thereby preventing the leading edge from contacting the Stapling Unit and curving.

5.4.1 Layable guide mechanism

- The Layable Guide Motor turns the cams at the front and rear, thereby moving the Layable Guide up or down.
- The Layable Guide Sensor detects the position of the Layable Guide Motor.

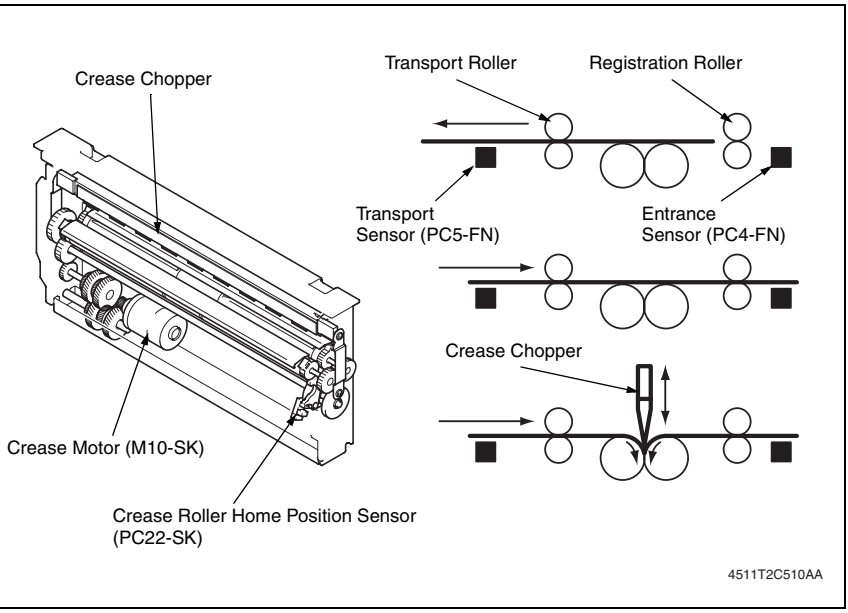


5.4.2 Operation timing

1. Raising the Movable Guide
   (power ON, Sleep cancelled, error reset, paper removed from tray)
2. Lowering the Movable Guide
   (When the transport of a copy set/stack to the center stapling position is completed)
3. Raising the Movable Guide
   (When the trailing edge of a copy set/stack deactivates the Saddle Exit Sensor)

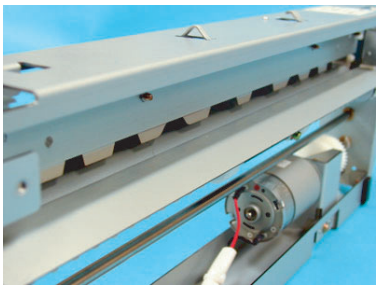
5.5 Center creasing mechanism

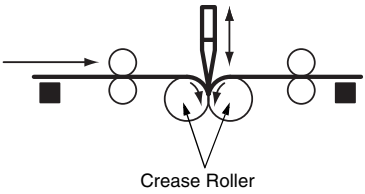
- The Entrance Sensor detects the trailing edge of the paper.
- The paper feed amount is determined for each paper size as counted from the timing when the trailing edge is detected. Center creasing is effected as follows. Specifically, the paper undergoes a switchback operation and is transported to the center creasing position as the motor is turned backward.
- The Crease Chopper is lowered and the center of the paper is pinched between the Crease Rollers and this creates a crease in the paper.
- After the center creasing, the paper is transported by the Transport Roller and then the Registration Roller as they are driven in that order.

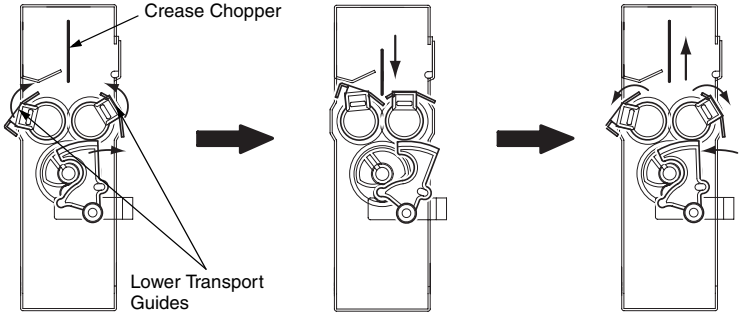


5.5.1 Operation

- When the Crease Motor is energized for one cycle of operation, the Lower Transport Guides are retracted to the right and left and the Crease Chopper makes one up-and-down reciprocating motion. In synchronism with the sequence of these operations, the Crease Roller turns one complete turn to pull the paper downward at its center.
- At the same time that the Lower Transport Guides returns to their original position, the Crease Chopper goes up.







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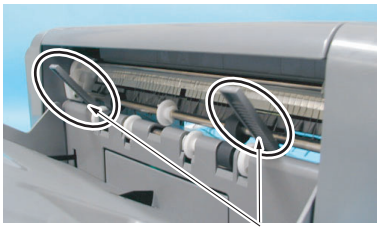
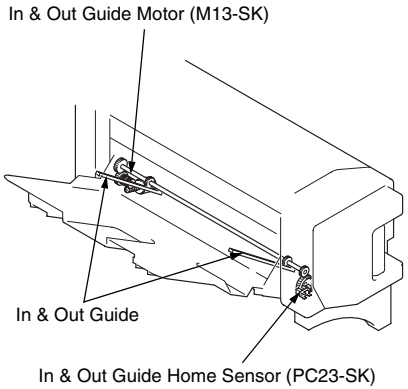
5.6 In & out guide

- When a copy set/stack is fed onto the tray, the In & Out Guide supports the leading edge of the paper of a large size so as to prevent it from pushing the trailing edge of the paper that has previously been fed out.
- The In & Out Guide is driven only when paper with a length of 257 mm or more will be stored.
- The In & Out Guide advances when the Entrance Sensor of the finisher is deactivated and retracts when the trailing edge of the paper leaves the Saddle Exit Sensor.

5.6.1 In & out guide mechanism

- The In & Out Guide Motor drives the In & Out Guide.
- The In & Out Guide Home Sensor is used to control the home position of the In &Out Guide.





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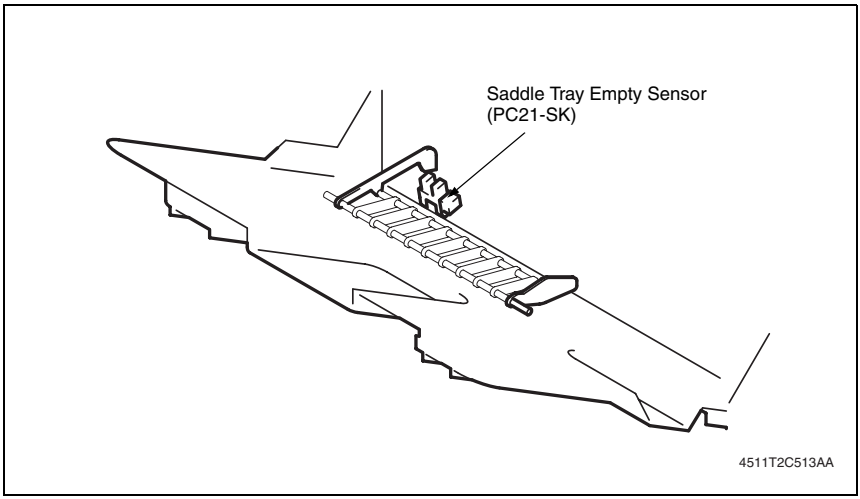
5.7 Tray paper detection

- When paper is fed onto the tray, it pushes the actuator, which causes the Paper Detection Sensor to detect the paper.



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